ENVIRO SWAT TEAM

Environmental Compliance in the Petrochemical Industry in the Sarnia Area

Environmental SWAT Team
Suite 1000, 305 Milner Avenue
Toronto, Ontario M1B 3V4
Telephone: 416-314-4278

www.ene.gov.on.ca/envision/swat/

Report of the Environmental SWAT Team:
Sarnia Inspection Sweep 2004 - 2005

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Executive Summary

Context

In February 2004, Ontario Environment Minister Leona Dombrowsky directed the Environmental SWAT Team to conduct a comprehensive inspection sweep of industrial facilities in the Sarnia area. The decision to undertake a sweep of this magnitude came after a number of facilities in Sarnia's industrial sector had, during the previous year, allowed potentially harmful chemicals to spill into the St. Clair River; two of those spills resulted in the temporary closures of water-intake facilities that supply drinking water to communities downstream.

Residents of the downstream communities—Wallaceburg, Walpole Island First Nation and Stag Island—as well as residents of private households downstream were rightfully frustrated that the quality of their drinking water supply was being compromised repeatedly. Minister Dombrowsky heard the residents' fears and concerns and deployed the SWAT Team to conduct a sweep of Sarnia's industrial sector. She wanted to determine whether the facilities in that region were living up to their environmental responsibilities, and if human health and the environment were being put at risk.

Environmental officers undertook an 11-month inspection sweep of Sarnia's industrial sector with the primary goal of ensuring that all facilities in that region were brought into compliance with environmental legislation. The team took these actions to help reduce the threat of future spills and unlawful discharges and emissions. The team also focused on finding legislative and regulatory gaps that could allow environmentally unsafe practices to exist at the facilities.

Overview of the Inspection Sweep

The Sarnia-area inspection sweep was the most comprehensive sweep of a major industrial sector ever undertaken by the Environmental SWAT Team.

The primary focus was to inspect areas with the potential for future spills that could pose risks to human health and/or the environment. This was done through comprehensive inspections of the facilities' air emissions, water discharges and spill prevention/contingency plans. SWAT officers looked at other areas within the facilities relating to waste management, laboratory operations and other processes/areas that must meet environmental legislative and regulatory requirements.

Summary of Findings

In total, the inspection sweep encompassed 35 petrochemical and related facilities. While the sweep did not identify any immediate impacts of non-compliance leading to concerns about human health or the environment, it is nonetheless troubling that almost 100% of facilities inspected during the sweep (34 out of 35) were found to be in non-compliance with one or more legislative and regulatory requirements.

Common deficiencies included:

- No spill contingency and/or spill prevention plans.
- Not having a Certificate of Approval for wastewater collection and treatment works or air emission control equipment.
- Altering equipment, systems, processes, or structure contrary to the existing Certificate of Approval (Air) or (Waste).
- Improper chemical handling, storage and identification.

These deficiencies are summarized in a table found on page seven of this document.

Of these, spill prevention and contingency plans are especially critical preventative measures for petrochemical facilities because spills can have health, environmental and social impacts on a community. Ontarians should be able to have confidence that the petrochemical industry is taking all necessary steps to prevent spills, especially because of the potential risk to human health and the environment that they pose.

In light of the above, the fact that 22.86% of the facilities inspected either had no spill prevention plan or spill contingency plan, or just had one of the two is cause for concern. As a result of the inspection sweep:

- six facilities were ordered to develop both a spill prevention plan and a spill contingency plan;
- two facilities were ordered to develop a spill prevention plan (each had a spill contingency plan).

The sweep resulted in the issuance of 32 Provincial Officer Orders. In total, more than 260 instances of non-compliance with environmental legislative and regulatory requirements were identified. (Refer to Appendix A for a detailed list of findings for each facility.) Timelines for complying with the conditions of the Provincial Officer Orders ranged from immediate to several months, depending on the severity of the violation, and/or complexity of the problems that needed to be addressed.

SWAT officers have followed up to ensure that companies have taken appropriate corrective actions. Many of the companies have already complied with the Provincial Officer Orders that were issued to them, while others continue to work towards the compliance requirements specified in the orders in the requisite timeframe.

Where warranted, violations have been referred to the Ministry of the Environment's Investigations and Enforcement Branch for follow-up.

Sound Business and Operational Practices

A wide variety of sound practices were found in many of the facilities (22 of 35) during the inspection sweep. Some of these practices, found in one or more of the facilities, are described below.

Containment

☐ monitoring sensors on surface water intake and discharge points with ability to use automatic trip gates, skimmers, absorbent booms, etc. and alarms to prevent discharges to the St. Clair River

Monitoring

☐ monitoring once-through cooling systems at intermediate points in the process to detect any leaks, which can result in spills being prevented

Operations

☐ closed-loop systems or electric fans as alternatives to once-through cooling water systems to prevent the discharge of contaminants to air or water

Waste Water / Storm Water Treatment

☐ secondary containment for storm water on site until tested, all ditches gated on final discharge

Contingency / Spill Planning

☐ Process Hazard Analysis (HAZOP study) of all key processes, with staff involved in identifying critical process areas and addressing solutions to reduce the use of hazardous chemicals, prevent contaminant discharge and minimize upsets

Staff and Training Programs

☐ ongoing staff training to ensure and encourage environmental protection, with emphasis on spill contingency plans and Effluent Monitoring and Effluent Limits (MISA) regulatory requirements

These practices would have a positive impact if implemented by more facilities.

The inspection sweep also provides a baseline for future inspections of the industry, and has identified potential areas for improvement for consideration by both industry and the Ministry. The Ministry will continue to work with petrochemical companies in the Sarnia area to achieve compliance with all environmental legislative and regulatory requirements.

Overview: Inspection Sweep

Context: Industrial Spills to the St. Clair River

There is a significant concentration of petrochemical companies in the Sarnia area[1]. Primarily involved with the production of petrochemicals, most of these facilities are located along a 30 kilometre stretch of the St. Clair River that travels through Sarnia and further into Lambton County. Figure 1 shows an aerial view of the densely industrial land, closely bordered by residences.

Wallaceburg, Walpole Island First Nation, Stag Island and a group of private households with a total population of about 15,000, draw their drinking water supplies downstream of the large concentration of petrochemical facilities.

An increase in the number of spills in Sarnia in 2003 from 2002 led to increasing concerns among the above-mentioned community regarding the potential risk to human health and the environment.

In light of the above, Environment Minister Leona Dombrowsky announced the deployment of the Environmental SWAT Team to undertake an inspection sweep of the petrochemical industry in the Sarnia area on February 6, 2004.

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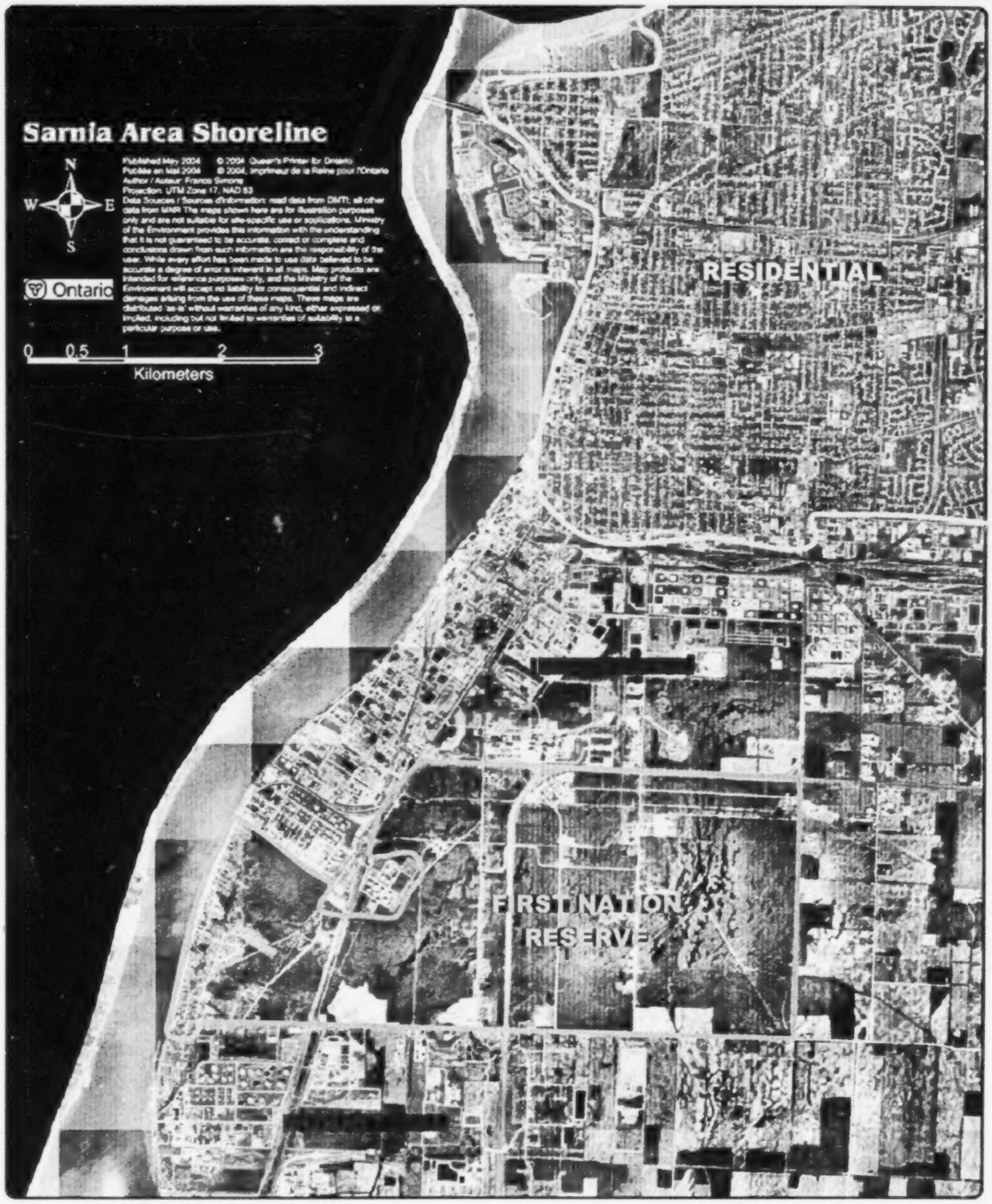
[1] The Sarnia area is characterized by a dense concentration of industrial facilities that include chemical plants, gas plants, petroleum refineries, plastics recyclers, fertilizer plants, co-generation electric stations, a thermal electric generation station and wastewater treatment plants.


Sarnia Area Shoreline
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S
Published May 2004 © 2004 Queen's Printer for Ontario
Publiée en Mai 2004 © 2004, Imprimeur de la Reine pour l'Ontario
Author / Auteur: Franco Simone
Projection: UTM Zone 17, NAD 83
Data Sources / Sources d'information: road data from DMTI; all other data from MNR The maps shown here are for illustration purposes only and are not suitable for site-specific use or applications. Ministry of the Environment provides this information with the understanding that it is not guaranteed to be accurate, correct or complete and conclusions drawn from such information are the responsibility of the user. While every effort has been made to use data believed to be accurate a degree of error is inherent in all maps. Map products are intended for reference purposes only, and the Ministry of the Environment will accept no liability for consequential and indirect damages arising from the use of these maps. These maps are distributed 'as-is' without warranties of any kind, either expressed or implied, including but not limited to warranties of suitability to a particular purpose or use.
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Figure 1: Aerial View of Sarnia Industrial Area with Surrounding Communities

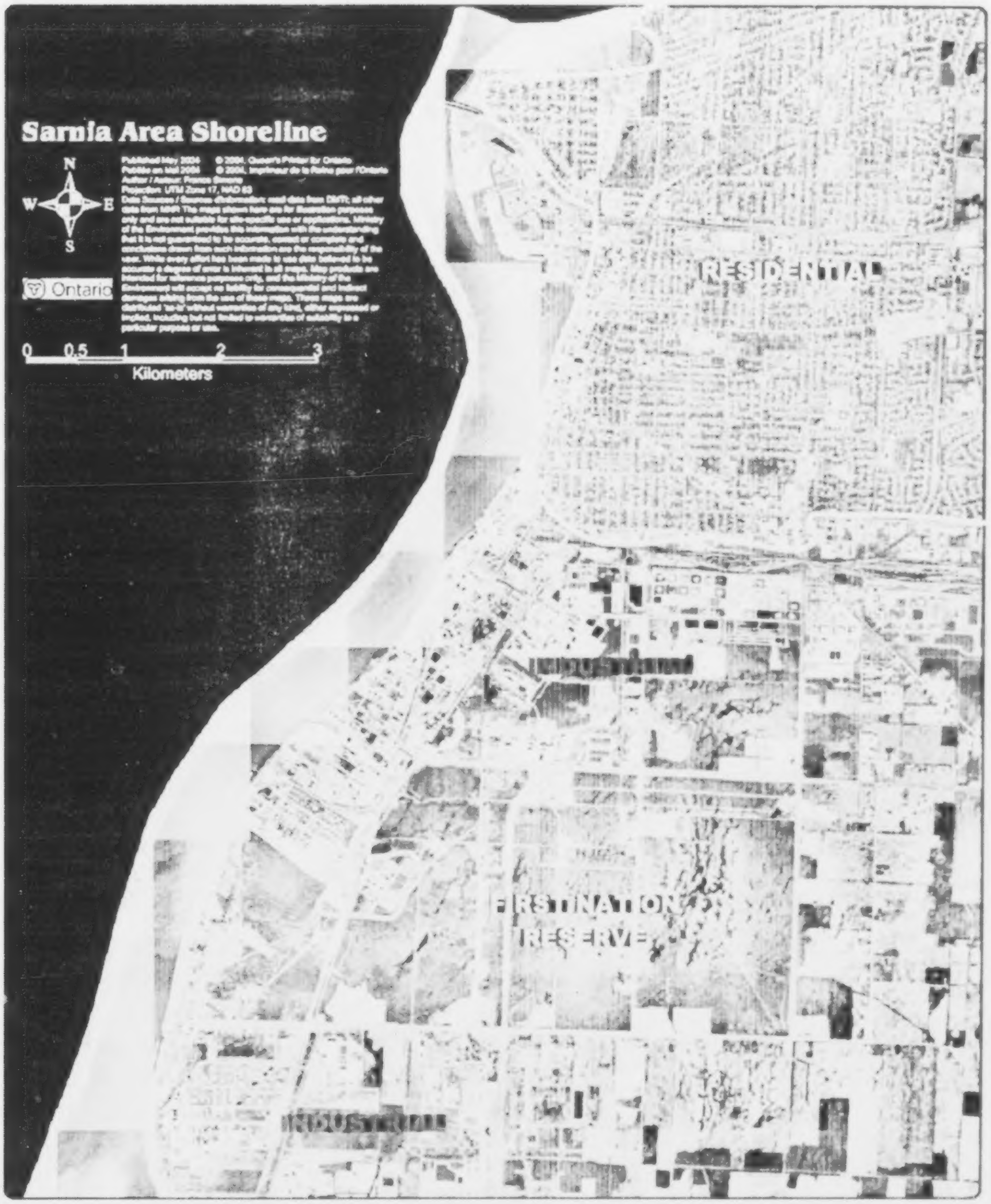

Figure 1: Aerial View of Sarnia Industrial Area with Surrounding Communities

Deployment

The Sarnia-area inspection sweep was the most comprehensive sweep of a major industrial sector[2] ever undertaken by the Environmental SWAT Team. (Refer to the *Backgrounder: Inspection Sweep Logistics* for more information.) Its specific objective was to ensure that the petrochemical and related facilities were following all applicable provincial environmental legislative and regulatory requirements. In addition, SWAT was asked to identify any additional measures that could contribute to the industry being better positioned to prevent spills in the future.

The primary focus of the inspection sweep was to inspect areas with the potential for future spills that could pose risks to human health and/or the environment. This was done through comprehensive inspections of the facilities' air emissions, water discharges and spill prevention/contingency plans. SWAT officers looked at other areas within the facilities relating to waste management, laboratory operations and other processes/areas that must meet environmental legislative and regulatory requirements. (Refer to the *Backgrounder: Legislative and Regulatory Framework* for more information.)

During any inspection, SWAT officers determine if an individual or company is in compliance with applicable environmental legislative and regulatory requirements, including conditions identified in Certificates of Approval or permits. Approvals and permits are legally binding instruments which may include specific requirements to ensure that the ongoing operations from the proposal will not result in harmful impacts to human health or the natural environment.

Where instances of non-compliance are found, SWAT officers have the authority[3] to issue Provincial Officer Orders which list the corrective action(s) the individuals or companies must take in order to comply with Ontario's environmental legislative and regulatory requirements. They also include a strict timeline for compliance.

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[2] Petrochemical facilities use a wide variety of chemicals in the manufacturing process, many of which, if not properly managed or disposed of, could pose significant human health and environmental risk.

[3] Provincial Officers may also issue Provincial Offences Act (POA) offence notices (tickets) and summonses. Offence notices carry a fine of up to $500, plus Victim Surcharges and associated court fees. In addition, they have the authority to secure plant areas to prevent access and/or use of equipment, as well as seize property and/or vehicle licence plates.

When serious non-compliance is found, SWAT officers may refer cases to the Ministry's Investigations and Enforcement Branch (IEB) for further review and possible investigation. (Refer to the *Backgrounder: Environmental SWAT Team* for more information.)

Summary of Facilities Inspected

In total, the inspection sweep encompassed 35 petrochemical and related facilities owned by the following companies (some of which have multiple facilities in the area):

- Air Liquide Canada Inc.
- Air Products Canada Ltd.
- Basell Canada Inc.
- Bayer Inc. (formerly H.C. Starck Canada)
- BP Canada Energy Resources Company
- Cabot Canada Ltd.
- Chinook Corporation
- Dow Chemical Canada Inc.
- Enbridge Pipelines Inc.
- Entropex Corporation
- Ethyl Canada
- Fibrex Insulations Inc.
- ICI Canada Inc.
- Imperial Oil Ltd.
- Invista (Canada) Company
- Katoen Natie Canada Company
- Lanxess Inc., (formerly Bayer Inc.) (three facilities)
- Nova Chemicals (Canada) Ltd. (two facilities)
- Nova Chemical Corporation (three facilities)
- Ontario Power Generation
- Praxair Canada Inc. (two facilities)
- Royal Polymers Limited
- SCU Nitrogen Inc.
- Shell Canada Products Ltd.
- Suncor Energy Products Inc.
- Terra International (Canada) Inc.
- TransAlta Energy Corporation (three facilities)

Twenty-one of the facilities are located in Sarnia and 14 are located in St. Clair Township. An aerial view of the area is provided in Figure 2, showing the location of the facilities inspected during the sweep.

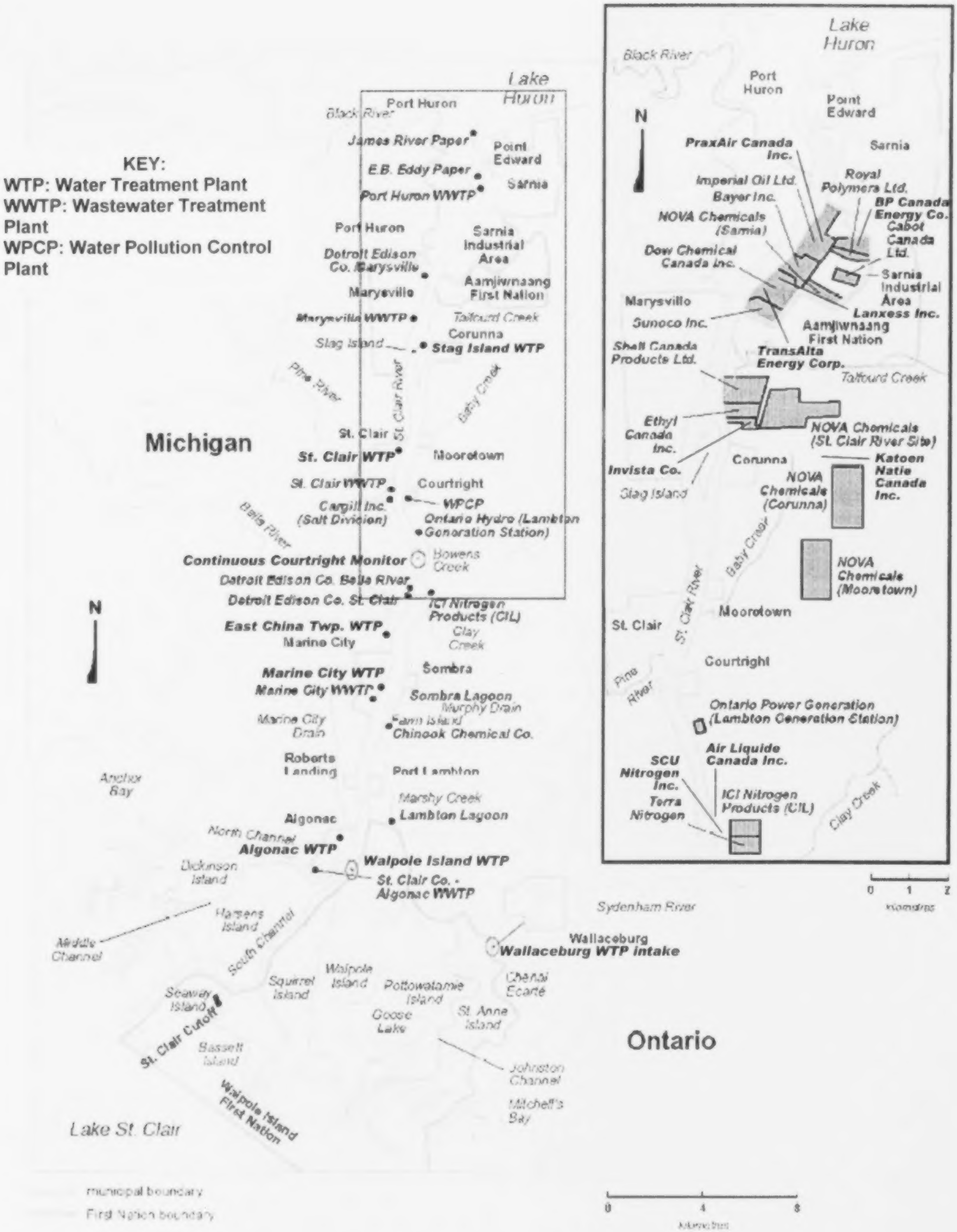

Figure 2: Facilities Inspected

Non-Compliance Identified

In total, the inspection sweep encompassed 35 petrochemical and related facilities. While the inspection sweep did not identify any immediate impacts of non-compliance leading to concerns about human health or the environment, it is nonetheless troubling that almost 100% of facilities inspected during the sweep (34 out of 35) were found to be in non-compliance with one or more legislative and regulatory requirements[4].

Common deficiencies included:

- No spill contingency and/or spill prevention plans.
- Not having a Certificate of Approval for wastewater collection and treatment works or air emission control equipment.
- Altering equipment, systems, processes, or structure contrary to the existing Certificate of Approval (Air) or (Waste).
- Improper chemical handling, storage and identification.

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[4] The one facility that was not found in non-compliance is a former chemical plan that is essentially used for storage of products and off-specification materials.

The following table shows which of these common deficiencies was found at each of the inspected facilities:

Number	Company Name	**Spill Contingency and/or Prevention Plans	C of A for Wastewater Collection or Air Emission Control Equipment	C of A (Air or Wastewater) for altering equipment, systems, processes or structure	Chemical Handling, Storage and Identification
1	Air Liquide Canada Inc	Y	Y	Y	Y
2	Air Products Canada Ltd	Y	Y	N	Y
3	Basell Canada Inc	Y	N	N	N
4	Bayer Inc	Y	N	Y	Y
5	BP Canada Energy Resources Company	Y	N	Y	N
6	Cabot Canada Ltd	N	N	N	Y
7	Chinook Corporation	Y	N	N	Y
8	Dow Chemical Canada Inc	Y	N	N	N
9	Enbridge Pipelines Inc	Y	N	N	Y
10	Entropex Corporation	Y	N	N	Y
11	Ethyl Canada	Y	N	N	Y
12	Fibrex Insulations Inc	N	N	N	Y
13	ICI Canada Inc	Y	N	N	Y
14	Imperial Oil Ltd	Y	N	N	N
15	Invista (Canada) Company	N	Y	N	N
16	Katoen Natie Canada Company	not required	Y	Y	Y
17	Lanxess Inc. Butyl 1	Y	N	N	Y
18	Lanxess Inc. Butyl 2	Y	N	N	Y
19	Lanxess Inc. landfill	Y	Y	Y	not required
20	NOVA Chemicals (Canada) Ltd. Styrene II Tashmoo	N	N	N	Y
21	NOVA Chemicals (Canada) Ltd. Styrene I	Y	Y	Y	Y
22	NOVA Chemicals Corporation St. Clair	Y	N	N	N
23	NOVA Chemicals Corporation Corunna	Y	N	N	Y
24	NOVA Chemicals Corporation Moore	N	N	Y	[illegible]
25	Ontario Power Generation Incorporated	Y	Y	N	Y
26	Praxair Canada Inc. Courtright	Y	Y	N	Y
27	Praxair Canada Inc. Sarnia	N	Y	N	Y
28	Royal Polymers Limited	Y	Y	N	N
29	SCU Nitrogen Inc	N	Y	N	N
30	Shell Canada Products Ltd	Y	N	N	N
31	Suncor Energy Products Inc	Y	N	Y	Y
32	Terra International (Canada) Inc	N	N	N	N
33	TransAlta Energy Corporation (Power Island)	Y	Y	N	Y
34	TransAlta Energy Corporation (South Block)	Y	Y	Y	Y
35	TransAlta Energy Corporation (North Block)	Y	Y	N	Y

Note: The chart shows a 'Y' when the facility meets requirements and an 'N' when the facility does not meet requirements.

Of these, spill prevention and contingency plans are especially critical preventative measures for petrochemical facilities because spills can have health, environmental and social impacts on a community. Ontarians should be able to have confidence that the petrochemical industry is taking all necessary steps to prevent a spill, especially because of the potential risk to human health and the environment if a spill does occur.

In light of the above, the fact that 22.86% of the facilities inspected either had no spill prevention plan or spill contingency plan, or just had a spill prevention plan is cause for concern. As a result of the inspection sweep**:

- six facilities were ordered to develop both a spill prevention plan and a spill contingency plan;
- two facilities were ordered to develop a spill prevention plan (each had a spill contingency plan).

Common types of non-compliance

The most common type of non-compliance related to hazardous waste generation and manifesting requirements where 23 per cent of the non-compliance instances, involved 21 facilities (areas of non-compliance included improper manifesting of wastes or not meeting generator registration requirements).

Thirteen per cent of the instances of non-compliance discovered during the sweep related to facilities not meeting the requirements set out in existing Certificates of Approval (e.g., air emission control equipment and waste-water collection systems).

In addition, findings indicated that some facilities were conducting operations for which necessary Certificates of Approval had not been obtained.

Common Deficiencies
No spill contingency and/or spill prevention plans.
Waste-water collection and treatment works not approved, or altered contrary to approval
Equipment maintenance, calibration and record-keeping inadequate or lacking; Improper chemical handling, storage and identification
Waste manifesting and generator registration practices not in compliance with regulations
Air emission control equipment not approved, or altered contrary to Certificate of Approval
Lack of internal standards for staff training of equipment operation and maintenance
Treated effluent streams being monitored separately, but not after being combined before final discharge to receiver as a single stream
No temperature monitors on stack flares
No monitoring of internal process waste during operations
No monitoring of process cooling water at the source intake

In total, more than 260 instances of non-compliance with environmental legislative and regulatory requirements were identified in the 35 facilities. Figure 3 shows how the instances of non-compliance break down on a percentage basis according to type.

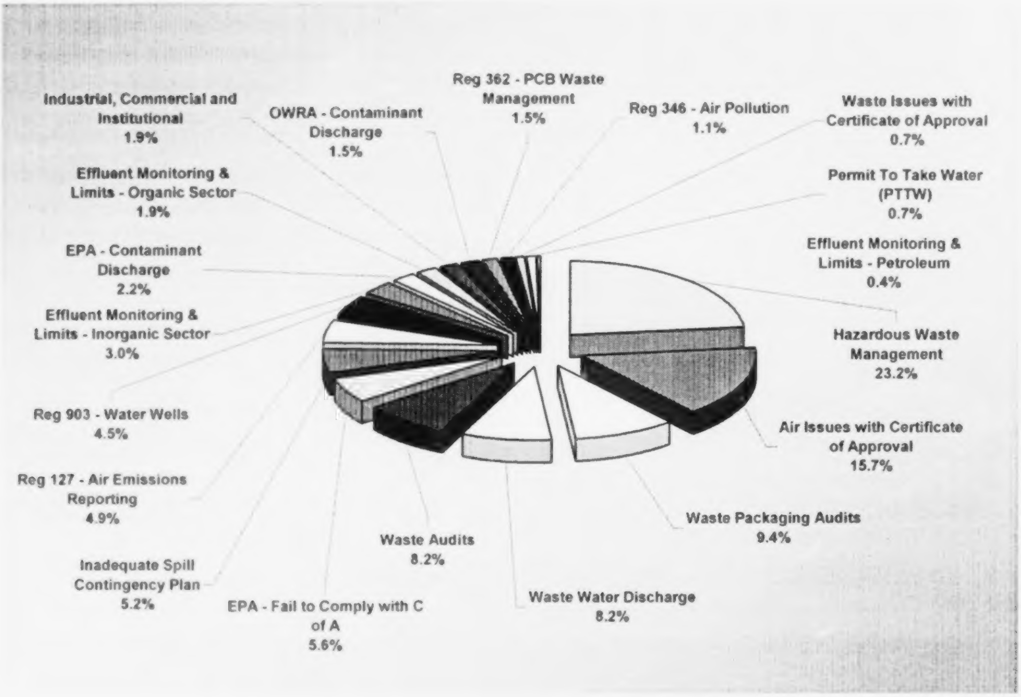

Figure 3: Percentage Non-Compliance by Type

Abatement Measures Ordered

The inspection sweep resulted in the issuance of 32 Provincial Officer Orders. Timelines for complying with the conditions of the Provincial Officer Orders ranged from immediate to several months, depending on the severity of the violation, and/or complexity of the problems that needed to be addressed.

The Provincial Officer Orders served on companies contained a wide variety of directives such as the following:

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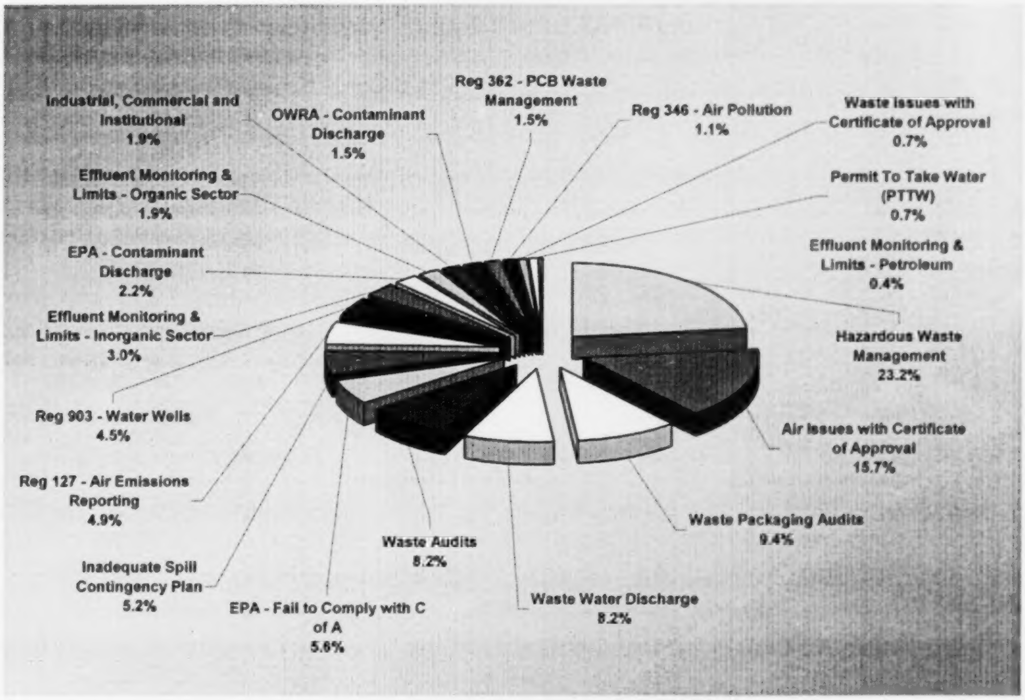

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Abatement Measures Ordered

The inspection sweep resulted in the issuance of 32 Provincial Officer Orders. Timelines for complying with the conditions of the Provincial Officer Orders ranged from immediate to several months, depending on the severity of the violation, and/or complexity of the problems that needed to be addressed.

The Provincial Officer Orders served on companies contained a wide variety of directives such as the following:

- develop and implement a spill prevention plan, a spill contingency plan, or both;
- apply to obtain and/or amend Certificate of Approval (Air) or (Sewage);
- maintain and calibrate equipment and keep records according to the Effluent Monitoring and Effluent Limits (MISA) regulations;
- rectify improper handling, storage and identification of chemicals;
- alter waste management practices to comply with regulations;
- improve internal standards for staff training on equipment operation and maintenance;
- monitor combined waste streams before final discharge to receiver as a single stream;
- install temperature monitors on stack flares;
- monitor internal process waste during operations;
- monitor process cooling water at the source intake.

Summary of Provincial Officer Orders Issued

Provincial Officer Orders were issued, where warranted, throughout the 12-month period of the inspection sweep. These Orders required the companies to address specific issues within a specified timeframe. Most frequently, Orders had multiple conditions that set out in detail the actions the companies had to take to come into compliance.

The following table provides a summary of the areas of non-compliance identified during the inspection of each facility. Refer to Appendix A for a detailed list of findings for each facility.

Facility	Areas of Non-Compliance for which Provincial Officer Orders were Issued
Air Liquide Canada Inc.	• minor non-compliance with existing air Certificate of Approval (failure to notify the Ministry of company name change) • non-compliance with generator registration requirement
Air Products Canada Ltd.	• inadequate spill containment for the storage of waste oil drums
Basell Canada Inc.	• a number of unapproved air emission sources from laboratory fume hoods and a welding garage • unapproved wastewater disposal • emissions from a flare that exceed regulatory requirements during power outages

Facility	Areas of Non-Compliance for which Provincial Officer Orders were Issued
Bayer Inc.	• no Certificates of Approval for the installation and use of equipment that has the potential to discharge contaminants into the natural environment
BP Canada Energy Resources Company	• minor air emission without Certificate of Approval • non-compliance with existing air Certificate of Approval • non-compliance with generator registration requirement
Cabot Canada Ltd.	• non-compliance with generator registration requirement • improper storage of chemicals / waste materials • non-compliance with staff training, sampling point alterations, equipment calibration, under the Effluent Monitoring and Effluent Limits (MISA) regulations • waste audit and waste reduction work plan not developed for the company as required • air emission without Certificate of Approval • modification to air emission source without Certificate of Approval amendment • non-compliance with Certificate of Approval (Air) • fugitive air emissions of carbon black • no spill prevention plan • written explanation of a set of laboratory results
Chinook Corporation	• air emission without Certificate of Approval • non-compliance with industrial sewage Certificate of Approval • non-compliance with generator registration requirement
Dow Chemical Canada Inc.	• air emission without Certificate of Approval • non-compliance with existing sewage Certificate of Approval • non-compliance with generator registration requirement
Enbridge Pipelines Inc.	• air emission without Certificate of Approval • non-compliance with generator registration requirement • modification to industrial sewage discharge without Certificate of Approval amendment
Entropex Corporation	• Certificate of Approval for air not amended to reflect site process changes • subject waste remaining on site for more than 90 days without proper reporting to the Ministry
Ethyl Canada	• no Certificates of Approval for several pieces of equipment that were discharging contaminants into the natural environment • a Certificate of Approval for sewage works that was not amended to reflect current site practices; improper manifesting of hazardous wastes

Facility	Areas of Non-Compliance for which Provincial Officer Orders were Issued
Fibrex Insulations Inc.	• no Certificates of Approval for the installation and use of equipment that has the potential to discharge contaminants into the natural environment • fugitive air emissions escaping through doors and vents • inadequate containment of, and management plan for, hoses and piping from storm-water pond • no Certificate of Approval for on-site sewage works • Inadequate spill contingency and containment plans
ICI Canada Inc.	• improper calibration of sampling equipment • no Certificates of Approval for the installation and use of equipment that has the potential to discharge contaminants into the natural environment • storage of waste oil for a period longer than three months • several groundwater monitoring wells that were poorly maintained
Imperial Oil Ltd.	• non-compliance with existing waste disposal site Certificate of Approval • non-compliance with waste manifesting requirement • failure to maintain monitoring wells • air emission without Certificate of Approval
Invista (Canada) Company	• exceeding pH levels in effluent • no spill prevention, control and counter-measure plan • lacking procedures to ensure trucks are decontaminated before pumping process waste
Katoen Natie Canada Company	• not registered as a waste generator • on-site wastes—oil, solvents and hydraulic fluids—not being properly stored, transported and removed • not submitting a required annual report on air emissions
Lanxess Inc. (three facilities)	• no Certificates of Approval for the installation and use of equipment that has the potential to discharge contaminants into the natural environment • no amended or new Certificate of Approval for the alteration of an existing sewage works • several poorly maintained groundwater monitoring wells • improper manifesting of hazardous waste
Nova Chemicals (Canada) Ltd. (2 Chemical Plants)	• non-compliance with generator registration requirement • non-compliance with Certificate of Approval (Air) • non-compliance with Certificate of Approval (Sewage) • no spill prevention plan • investigate ground water contamination Note: one facility did not receive an Order

Facility	Areas of Non-Compliance for which Provincial Officer Orders were Issued
Nova Chemicals Corporation – St. Clair River	• air emission without Certificate of Approval • non-compliance with existing Certificate of Approval (Air) • modification to industrial sewage discharge without Certificate of Approval amendment • non-compliance with generator registration requirement
Nova Chemicals Corporation – Corunna site	• air emission without Certificate of Approval • modification to air emission source without Certificate of Approval amendment • non-compliance with generator registration requirement • non-compliance with Permit To Take Water
Nova Chemicals Corporation – Mooretown site	• air emission without Certificate of Approval • non-compliance with existing Certificate of Approval (Air) • non-compliance with generator registration requirement • no spill prevention plan • failure to submit complete report as required under Reg.127 (Airborne Contaminant Discharge Monitoring & Reporting)
Ontario Power Generation	• non-compliance with industrial sewage discharge Certificate of Approval (not monitoring discharge temperature) • non-compliance with generator registration requirement
Praxair Canada Inc. (two facilities)	• no Certificates of Approval for the installation and use of equipment that has the potential to discharge contaminants into the natural environment • no spill prevention plan • improper storage of hazardous materials
Royal Polymers Limited	• air emission without Certificate of Approval • non-compliance with Certificate of Approval for sewage discharge • non-compliance with waste manifesting requirement
SCU Nitrogen Inc.	• improper storage of waste materials • a Certificate of Approval (Air) that was not amended to reflect current site practices • no spill prevention plan
Shell Canada Products Ltd.	• improper storage of waste materials • a Certificate of Approval for sewage works that was not amended to reflect current site practices • no Certificates of Approval for the installation and use of equipment that has the potential to discharge contaminants to air

Facility	**Areas of Non-Compliance for which Provincial Officer Orders were Issued**
Suncor Energy Products Inc.	• no Certificates of Approval for the installation and use of equipment that has the potential to discharge contaminants into the natural environment • waste audit and waste reduction work plan not developed for the company as required by regulation
Terra International (Canada) Inc.	• a number of unapproved emission sources, including: laboratory equipment, power plant and associated equipment, diesel generating set, ammonium nitrate plant and associated equipment • unapproved increase in production capacity resulting in a potential increase in air emissions • no operations manual for a spray paint booth as required in the ministry-issued Certificate of Approval • improper sewage sludge dewatering process • lack of a general spill contingency plan • poorly maintained groundwater monitoring wells • mixing of wastes that should be stored separately and labelled properly • incomplete record keeping • effluent discharge exceedances under the Effluent Monitoring and Effluent Limits (MISA) regulations
TransAlta Energy Corporation (three facilities)	• non-compliance with discharge limits specified in industrial sewage Certificate of Approval

Where warranted, violations were referred to the Ministry's Investigations and Enforcement Branch for follow-up.

SWAT officers have followed up to ensure that companies have taken appropriate corrective actions.

To date, many of the companies have complied with the Provincial Officer Orders that were issued to them, while others continue to work towards the compliance requirements specified in the orders in the requisite timeframe.

Response of the Sarnia-Area Petrochemical Industry

Moving toward better environmental practices

Industry has made strides towards enhancing its environmental record. A number of the Sarnia-area companies are part of industry organizations that work together to address local environmental issues and concerns. Chief among these associations are the Sarnia Lambton Environmental Association (SLEA)[5] and the Canadian Chemical Producers' Association (CCPA):

Excerpt from a media interview with Steve Bolt, (then) President, SLEA, May 2004

"...Events over the past year have largely shattered the community's trust in industry and we must dedicate ourselves to rebuild that trust..."

The Observer (Sarnia), Friday, May 21, 2004 Page A1

- In 2001, SLEA formed an incident prevention committee to review key environmentally-related incidents for lessons on how such incidents can be avoided at other industrial sites. Sixteen of its member companies were included in the Sarnia-area inspection sweep.
- Ten of the Sarnia-area companies included in the inspection sweep belong to the Canadian Chemical Producers' Association (CCPA)[6] and adhere to its Community Awareness Emergency Response (CAER) program. CCPA members are committed, as a condition of membership under Responsible Care® to report to CCPA and to their communities on emissions from their facilities and to respond to any concerns that the public or government may have with these emissions.

In addition, three facilities[7] are ISO (International Standards Organization) 14001-certified (a voluntary environmental management program). This designation means that the company's environmental management system has been certified by an external third party organization. Briefly, organizations seeking the designation must implement, maintain and seek to continuously improve an environmental management system and ensure compliance with environmental laws and regulations, among others.

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[5] Originally formed as the Lambton Industrial Society in 1967, the association reconstituted itself as the Sarnia Lambton Environmental Association in 2001.

[6] CCPA represents 70 major chemical producers nationally, 41 of which are in Ontario, producing more than 90% of industrial chemicals in Canada.

[7] The three facilities are owned by Ontario Power Generation, Suncor Energy Products Inc. and Shell Canada Products Ltd.

There are a number of environmental initiatives in which industry has been an active partner in creating enhanced monitoring capacity, including 'real time' sharing of data, with the Ministry. Two SLEA initiatives are:

- a water monitoring station in the St. Clair River at Courtright[8], with data being shared with the Ministry;
- a monitoring network for ambient air quality incorporating stations in Corunna and Sarnia, with data being shared with the Ministry.

In addition, SLEA also assists the Ministry with the management of an area-wide approach for maintaining acceptable air quality during periods when emissions from plants could lead to high local concentrations of sulphur dioxide – known as the Lambton Industry Meteorological Alert (LIMA).

Sound Business and Operational Practices

In its Sarnia-area sweep, SWAT officers found a wide variety of sound practices in many of the facilities inspected (22 out of 35). Some of these practices, found in one or more of the facilities, are described below. Appendix A contains details for each of the 35 facilities.

Contingency / Spill Planning

☐ Process Hazard Analysis (HAZOP study) of all key processes, with staff involved in identifying critical process areas and addressing solutions to reduce the use of hazardous chemicals, prevent contaminant discharge and minimize upsets
☐ comprehensive spill management program
☐ making spill management plan available throughout the facility through computer kiosks, with printed material relevant to the nearby industrial processes
☐ contingency planning, including development of what-if scenarios with periodic reviews
☐ ability to redirect water in cases of spills
☐ all environmentally critical process areas clearly labelled and colour coded

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[8] This monitor, fully automated, was established in 1987. It analyzes samples of river water on an hourly basis. Twenty chemical compounds associated with the refining of petroleum and the manufacture of chemicals are tracked.

☐ ability through redundant systems to lock out process equipment in case of spill

☐ conductivity meter, pH meter and flame ionization detectors (for Total Petroleum Hydrocarbons) and refractive sheen sensors (for Petroleum Hydrocarbons) connected to trip gates and/or alarms in discharge ditch

Containment

☐ monitoring sensors on surface water intake and discharge points with ability to use automatic trip gates, skimmers, absorbent booms, etc. and alarms to prevent discharges to the St. Clair River

☐ containment areas with manual and/or automatic valves to direct contained water

☐ dykes, earthen berms or other containment structures, placed around storage tanks and process areas to hold and, where appropriate, re-direct site surface drainage

☐ treatment of some or all water contained on site prior to testing and discharge to the St. Clair River

☐ ability to redirect water in cases of spills

Monitoring

☐ monitoring once-through cooling systems at intermediate points in the process to detect any leaks, which can result in spills being prevented

☐ air monitoring for entire site

☐ continuous auto samplers for hydrocarbons on non-contact cooling water

☐ monitoring and alarming of process operations, with minimum standards for ensuring that monitors and alarms are in working order (e.g., at least once a shift)

☐ alarms that detect contaminants in air, with the production system shutting down if alarm tripped

Operations

☐ closed-loop systems or electric fans as alternatives to once-through cooling water systems to prevent the discharge of contaminants to the air or water

☐ all process areas under video-camera surveillance, so upsets are noted early

☐ periodic testing of cooling water systems to determine integrity

☐ all process units and drains connected to treatment plant

Waste Water / Storm Water Treatment

- ☐ secondary containment for storm water on site until tested, all ditches gated on final discharge
- ☐ storm water retention ponds to manage all storm water on the site
- ☐ all process water directed to lagoon and treated through sand filter
- ☐ storm water management using collected storm water as make-up water in their process
- ☐ alarmed gates for diverting discharge effluent to contaminant lagoon when necessary
- ☐ batch discharges with testing prior to discharge
- ☐ all storm water collected and piped to an off-site plant for treatment
- ☐ conductivity monitors on condensate and storm water
- ☐ automated waste-water treatment plant, capable of diverting final effluent on automated alarms to ponds for storage
- ☐ wetlands used for final polishing, with site being made into conservation area with the assistance of Ducks Unlimited

Staff and Training Programs

- ☐ ongoing staff training to ensure and encourage environmental protection, with emphasis on spill contingency plans and Effluent Monitoring and Effluent Limits (MISA) requirements
- ☐ dedicated on-site environmental staff and health and safety manager
- ☐ environmental compliance consultant on staff or on retainer

Maintenance

- ☐ automated and computerized proactive maintenance system with clear timelines and schedules
- ☐ electronic maintenance catalogue and reporting, and regular evaluation of equipment
- ☐ formalized inspections of refinery equipment according to industry standards (e.g., American Petroleum Institute)

Reuse and Recycling

- ☐ wet scrubbers used to collect calcium carbonate from waste streams, which is then sold as raw material for making drywall
- ☐ heat reclamation units used with new turbines
- ☐ high-technology, steam super-heater installed, capable of burning alternative fuels

Future Directions

The Environmental SWAT Team strives to look not only at today's activities, but also to new ways of achieving compliance and supporting decision-making inside industry and Ministry.

In addition to the specific instances of non-compliance that have been (or will be) remedied as a result of the inspection sweep, a number of other opportunities for environmental improvement were also identified. These opportunities are highlighted here for consideration by both industry and the Ministry.

Improved Environmental Performance

Industry

- As indicated earlier in the report, SWAT officers observed a number of sound industrial practices during the Sarnia-area sweep. If more widely adopted, these could reduce the potential risk of contaminant discharges into the environment.

Benefits of the Inspection Sweep

- A strong compliance and enforcement presence means higher levels of environmental protection.
- A healthier ecosystem with cleaner air, water and land for all people of Ontario.
- Fairness for those companies who comply with Ontario's environmental laws.
- Promotion of a better understanding of good environmental practices within the sectors, especially through encouraging the widespread adoption of best practices within the industry.
- Increased knowledge about sectors with high non-compliance rates and discovery of new ways to resolve environmental issues in these sectors, by working with companies within these sectors to resolve them.
- Strong enforcement encourages compliance and deters companies from future violations.

Those that would have the most impact if implemented by the petrochemical industry in the Sarnia area are:

- placing monitoring sensors on surface water intake and discharge points with ability to use automatic trip gates, skimmers, absorbent booms, etc. and alarms to prevent discharges to the St. Clair River;
- monitoring once-through cooling systems at intermediate points in the process to detect any leaks and diversion/containment of contaminated water;
- using closed-loop systems or electric fans as alternatives to once-through cooling water systems to prevent the discharge of contaminants to air or water;

  - having storm water retention ponds to manage all storm water on the site.

- SWAT found that not all companies that were inspected had spill prevention plans and spill contingency plans. Putting these preventive measures in place would enhance the protection of human health and the environment. It would likely also contribute to restoring the confidence of nearby residents in the industry's commitment to safety and spill prevention.

- Many of the companies inspected had, over the years, obtained many Certificates of Approvals. In fact, some had more than 100 approvals for new processes, additions and changes that had happened – and been approved – incrementally at the facility over decades. However, having so many approvals makes it difficult for both the company and the Ministry to have a clear understanding of the rules that are in effect and to be complied with on a facility-wide basis. Only two facilities that were inspected had consolidated or comprehensive Certificates of Approval for their air emissions.

  It would be beneficial for complex facilities, such as many of those inspected in Sarnia area with their potentially large environmental and human health impacts, to engage cooperatively with the Ministry in a priority exercise to update all Certificates of Approval. Further, at the same time, companies discharging air emissions from multiple points within the same property should be encouraged to apply for a consolidated or comprehensive site-wide Certificate of Approval.

Excerpt from a media interview with Scott Munro, General Manager, SLEA, March 2004

"We said we could reach zero and we haven't done it...Some incidents that might not have received attention in the past are getting it now . . . but the most effective way to deal with this is to stop having incidents."

The Observer (Sarnia), Monday, March 22, 2004, Page A1

- The Effluent Monitoring and Effluent Limits (MISA) regulations require annual public reporting by the facilities they cover. However, often the information is difficult to access by the public (e.g., may only be obtained by direct request to each individual facility). Easy-to-access public reporting of data (e.g., via the Internet) can have major environmental benefits. The community can have access to information about matters that may affect them and peer pressure can also result in increased environmental performance. SWAT believes, based on the intensity of community interest in the environmental impacts of these industries, that enhanced public reporting could be beneficial to all involved.

Ministry Business Process Improvements

- SWAT officers have the authority to determine whether a facility is in compliance with current environmental legislative and regulatory requirements and its approvals and permits. In some cases, "current" actually may refer to standards put in place some time ago, long before more recent scientific advances and new technologies. The Ministry should consider how best to keep these standards and guidelines up-to-date. For example, the Chemical Storage Guidelines were developed in 1978. While recognizing that the Ministry is currently in the process of updating these guidelines, it would be beneficial to expedite the process to the extent possible.

- Companies may carry out self-initiated assessments of existing or potential environmental impacts of their operations. These assessments may identify areas of potential environmental risk. This information can be used to improve the environmental performance of the company. This information is confidential to the company in order to encourage these voluntary evaluations of environmental performance and progress. As a matter of course, the Ministry may not require access to this information, though it may be provided voluntarily by the company. Unless required for emergency purposes, the information is available only in limited circumstances.

  Having the authority to access this information in a more timely fashion could be helpful in the Ministry's inspections of high risk industries, especially when there is the potential for off-site contaminant migration. The Ministry's policy on this matter – Guideline H-9: Policy and Guideline on Access to Environmental Evaluations – was last revised in 1996. It may be useful to consider reviewing Guideline H-9 to determine whether it needs updating to facilitate access to this type of information for compliance purposes.

Conclusion

The inspection sweep of the petrochemical industry in the Sarnia area was SWAT's first comprehensive sweep of a major industrial sector of this complexity. Its findings and the experience gained in undertaking a project of this magnitude provide a baseline for future inspections of the industry, and identified areas for improvement for consideration by both industry and the Ministry.

One of the ongoing benefits of SWAT inspection sweeps is the heightened awareness within the sector of Ontario's environmental legislative and regulatory requirements and the need to be in compliance with them. In the case of the petrochemical industry in the Sarnia area, companies have been made well aware of the need for better spill prevention.

The sound business and operational practices that SWAT has identified in this report would make a difference if they were implemented more widely – industry should do so.

While Ontario's environmental legislative and regulatory requirements are demanding, they nonetheless require – and Ontarians deserve – industry's full attention. That said, sound environmental protection needs the involvement and commitment of all involved. To this end, the Ministry will continue to work with petrochemical companies in the Sarnia area to achieve compliance with environmental legislative and regulatory requirements.

Backgrounder: Inspection Sweep Logistics

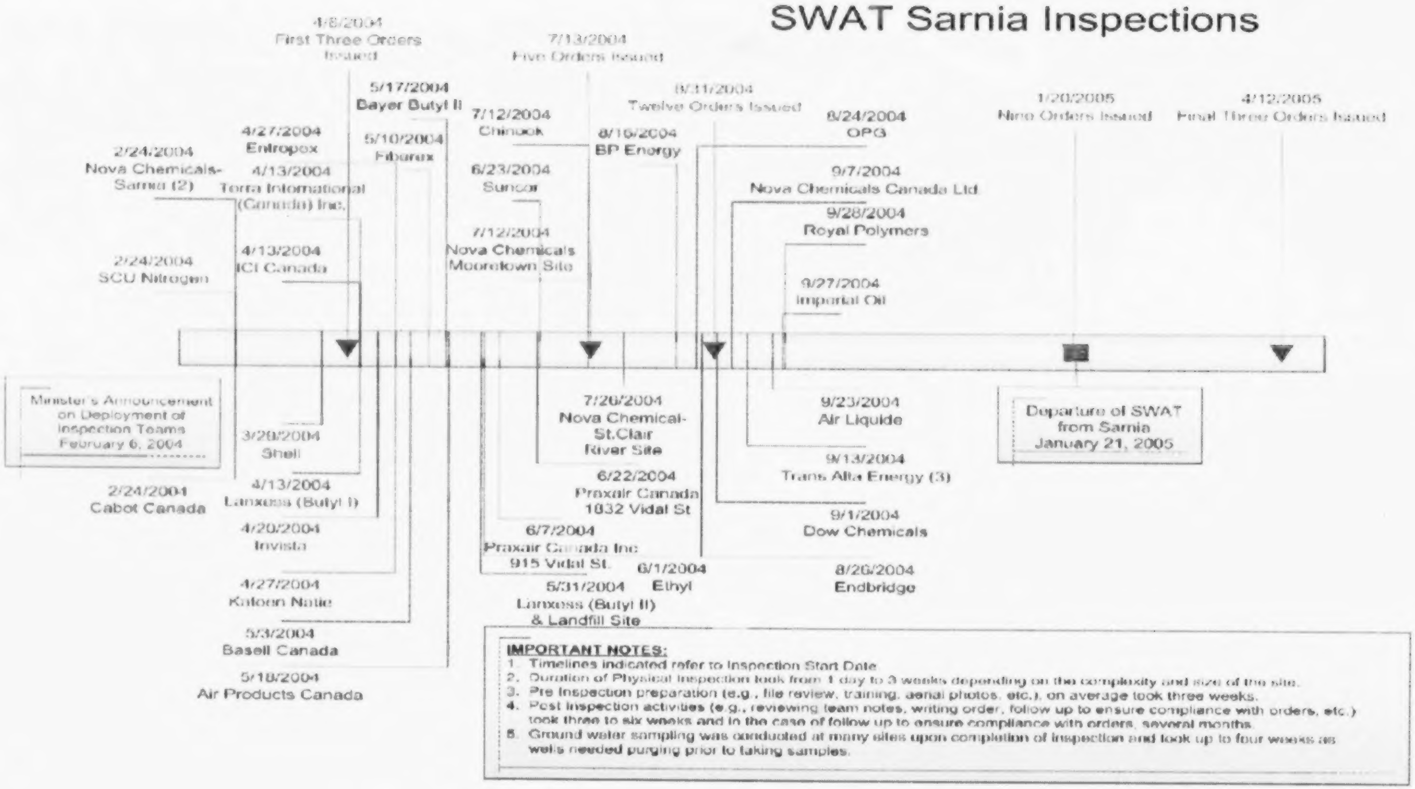
The Environmental SWAT Team's sweep of petrochemical and related facilities in the Sarnia area focused on operations with the potential for spills whether through emissions to air and/or discharges to the St. Clair River.

Initial Deployment

The day after the Minister's announcement, SWAT officers started mobilizing to establish a temporary field office in Sarnia to coordinate the sweep. The field office centred around the mobile command unit that consisted of 11 workstations with its own computer network server (to allow for high speed remote access to ministry data systems) and associated office equipment (photocopier, fax, printers, etc). In addition, there were four RV style mobile offices and SWAT's specialized sampling trailer. SWAT also drew on the experience of the Ministry's Sarnia District Office staff who had extensive knowledge of the facilities identified in the inspection sweep (refer to the *Backgrounder: Sarnia District Office* in this report for more detail). Figure 4 provides a timeline of the twelve-month operation.

While the petrochemical industry was aware of the presence of the Environmental SWAT Team, it was not given advance notice of which facilities would be inspected nor did it know in advance when any facility would be inspected.

Initially, the Sarnia-area inspection sweep required the deployment of the entire SWAT Sector Inspection Unit – 30 provincial officers. The officers were broken into five teams of six officers, each with its own specialized sampling team member. The inspection sweep also drew on the staff and resources of other branches such as the Ministry's Environmental Monitoring and Reporting Branch, the Laboratory Services Branch and the Environmental Assessment and Approvals Branch.



IMPORTANT NOTES:

1. Timelines indicated refer to Inspection Start Date.
2. Duration of Physical Inspection took from 1 day to 3 weeks depending on the complexity and size of the site.
3. Pre Inspection preparation (e.g., file review, training, aerial photos, etc.), on average took three weeks.
4. Post inspection activities (e.g., reviewing team notes, writing order, follow up to ensure compliance with orders, etc.) took three to six weeks and in the case of follow up to ensure compliance with orders, several months.
5. Ground water sampling was conducted at many sites upon completion of inspection and took up to four weeks as wells needed purging prior to taking samples.

Figure 4: Timeline of Inspection Sweep

The inspection sweep required that SWAT officers undergo a specialized safety training program specific to the petrochemical industry[9]. The training was provided through the Sarnia-Lambton Industrial Educational Co-operative (SLIEC), an organization that provides training for several of the area companies.

Diversity of Facilities Selected for Inspection

Many of the facilities were very large and complex, involving a range of industrial processes and materials. The following table groups the 35 facilities into nine broad categories.

Category	Total Number	Facilities Included
Chemical plant	15	Basell Canada Inc. Bayer Inc. (formerly H.C. Starck Canada) Cabot Canada Ltd. Chinook Corporation Dow Chemical Canada Inc. Fibrex Insulations Inc. Invista (Canada) Company Lanxess Inc., (formerly Bayer Inc.) (two facilities) Nova Chemicals (Canada) Ltd. (two facilities) Nova Chemical Corporation (three facilities) Royal Polymers Limited
Petroleum refinery	5	Ethyl Canada BP Canada Energy Resources Company Imperial Oil Ltd. Shell Canada Products Ltd. Suncor Energy Products Inc.
Electric generation	4	Ontario Power Generation TransAlta Energy Corporation (three facilities)
Gas plant	4	Air Liquide Canada Inc. Air Products Canada Ltd.

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[9] One of the risks closely associated with petroleum refineries, for example, is exposure to hydrogen sulfide. The presence of hydrogen sulphide is apparent because of the characteristic "rotten egg" smell. However, concentrations above 150 ppm may overwhelm the olfactory nerve so that the victim may have no warning of exposure. Low-level exposure to H_2S results primarily in irritation to mucous membranes and the respiratory system; high-level exposures result in more neurological and pulmonary symptoms, including possible loss of consciousness; and, very high concentrations lead to cardio-respiratory arrest because of brainstem toxicity. SWAT staff used personal H_2S monitors where necessary in areas that posed such risk.

Category	Total Number	Facilities Included
		Praxair Canada Inc. (two facilities)
Fertilizer plant	2	SCU Nitrogen Inc. Terra International (Canada) Inc.
Plastic recycler	2	Entropex Corporation Katoen Natie Canada Company
Landfill site	1	Lanxess Inc., (formerly Bayer Inc.)
Natural gas	1	Enbridge Pipelines Inc.
Wastewater treatment	1	ICI Canada Inc.

The number of chemical and industrial processes within each facility raised a wide range of potential environmental challenges and complexities. The release points varied from steam powered flare stacks burning multiple waste streams to fugitive emissions[10] from vents on aboveground storage tanks. The release of emissions that had to be assessed ranged from odours and particulates to other priority air pollutants such as carbon monoxide (CO), nitrogen oxides (NOx), sulphur oxides (SOx) and volatile organic compounds (VOCs).

In addition, the concentration of the petrochemical industry in this area has, over time, led to myriad overlapping contractual arrangements. In particular, individual corporate responsibility for waste handling has become very complex. For example, individual companies have sold process units, buildings and/or treatment systems to independent third parties who manage them. In some cases, one company owns the land, another company buys the pumps and both benefit from increased efficiencies. As a result, it was, in some cases, difficult to track certain wastes as they moved from one facility to another and, subsequently, to decide which company in any given instance was responsible for the proper handling and disposal of those wastes.

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[10] Fugitive emissions can be defined as uncontrolled releases not confined to a stack, duct or vent. These emissions generally include equipment leaks, emissions from the bulk handling or processing of raw materials, windblown dust and a number of other specific industrial processes.

Detailed Planning Requirements

As a result, SWAT engaged in very detailed planning to ensure the effectiveness of the targeted inspections, as well as to protect the health and safety of the officers and the public. Key components of the comprehensive planning that went into each facility included in the inspection sweep are described below.

Key Planning Components for Inspections

☐ Visual surveys of the exterior of each facility and neighbouring area.

☐ Aerial flyovers where necessary to obtain an aerial picture of the selected facilities.

☐ Archival searches of geo-referenced data and comparisons with previous aerial photos (i.e., to detect changes that may or may not have been reported to the Ministry as required).

☐ Detailed discussions with Sarnia District Office staff to fully understand the history and key environmental issues of the facilities involved

☐ Extensive file reviews of all data held by the Ministry.

The time taken for the review of ministry-held data and finalization of detailed inspection plans varied depending on the size of the facility, types of processes involved and the specific focus of the inspection. At larger and more complex facilities, inspections were sometimes split up by area of focus – air emissions, water discharges, or other contributions to pollution. Inspection plans were developed and reviewed before detailed inspection activities took place at any facility. To be efficient, many of the activities occurred concurrently. For example, as the file reviews, etc. were being completed, initial sampling programs were started at some of facilities on February 12, 2004.

Facility inspection times varied greatly, from one day for a plastics recycler to almost three months for a large plant. As sampling and other data was collected, SWAT program analysts conducted detailed analyses of all compliance-related information to assess trends, gaps, best practices, as well as issues requiring follow-up. An outline of the tasks typically associated with an inspection is provided below.

Outline of Tasks for Inspection Sweep

☐ Meet with company staff at the start of an inspection to be briefed on plant operations and site-specific safety issues.

☐ Review proponents' applications and Certificates of Approval for compliance purposes.

☐ Physically inspect emission sources, chemical/waste storage areas and process areas.

☐ Assess documentation such as a spill contingency and preventative maintenance plans, where available.

☐ Assess company processes.

☐ Obtain samples for analysis.

☐ Identify sound operating practices that assist the company with environmental compliance and that may be shared with other facilities.

☐ Request any additional documentation required.

☐ Fully document all inspection findings.

☐ Debrief owner of facility at the conclusion of the field inspection.

☐ Issue a Provincial Officer Order identifying the corrective actions required for the facility to come into compliance with environmental legislation and regulations, where warranted.

☐ Determine whether referral to Investigation and Enforcement Branch for follow-up is warranted.

Addressing Community Concerns

As well as inspecting individual industrial facilities, the Environmental SWAT Team participated in meetings / information sessions with the Industrial Pollution Action Team (IPAT) and a variety of stakeholders, such as:

- Wallaceburg Advisory Team for Cleaner Habitats (WATCH) (community group);
- Bi-national Public Advisory Council (BPAC) for the St. Clair River Remedial Action Plan;
- Bayer Community Advisory Council (co-chaired by industry and community);
- Bluewater Community Advisory Panel (co-chaired by industry and community).

Backgrounder:
Legislative and Regulato

Legislative and Regulatory Framework for the Inspection Sweep

The Ministry of the Environment ensures that all undertakings requiring approval are carried out in accordance with legislation and associated regulations, including the:

- *Ontario Water Resources Act*
- *Environmental Protection Act*
- *Pesticides Act*
- *Environmental Assessment Act*
- *Environmental Bill of Rights*
- *Safe Drinking Water Act*
- *Nutrient Management Act*

Certificates of Approval are required for facilities that release emissions to the atmosphere, discharge contaminants to ground and surface water, provide potable water supplies, or store, transport, process or dispose of waste. Owners (referred to as "proponents") of these activities are required to obtain Certificates of Approval to ensure that the environment will not be adversely affected by their operations.

Certificates of Approval address the site specific considerations relevant to the activity being considered for approval, provide enforceable requirements that ensure protection of human health and the natural environment, and compliance with legislation and policy / guidelines.

Similar to a Certificate of Approval, the Ministry may issue permits for specific undertakings. One example is the regulation of water takings through the Permit to Take Water (PTTW) process under section 34 of the *Ontario Water Resources Act*. The goal of PTTW is to ensure the fair sharing, conservation and sustainable use of Ontario's surface and ground waters.

Both the PTTW and the approval process include an opportunity for public input. The Environmental Bill of Rights sets out rules regarding the types of applications that it covers and explains how Ontario residents may provide comments on a proposal.

If the proposal meets the Ministry's requirements and the public's environmental concerns are addressed appropriately, the applicable "approval" or "permit" is issued. Approvals and permits are legally binding instruments which may include specific requirements to ensure that the ongoing operations from the proposal will not result in harmful impacts to human health or the natural environment.

The types of Certificates of Approval or permits most commonly held by the facilities involved in the SWAT inspection sweep are:

Air – *Environmental Protection Act*, section 9

- Construction, alteration, extension or replacement of any plant, structure, equipment, apparatus, mechanism or thing that may discharge or from which may be discharged a contaminant (including noise) into any part of the natural environment other than water.
- Alteration of a process or rate of production with the result that a contaminant may be discharged into any part of the natural environment other than water or the rate or manner of discharge of a contaminant into any part of the natural environment other than water may be altered.

Waste – *Environmental Protection Act*, section 27

- Using, operating, establishing, altering, enlarging or extending a waste management system or a waste disposal site.

Water Taking – *Ontario Water Resources Act*, section 34

- Taking of more than a total of 50,000 litres a day for municipal, industrial, commercial and irrigation purposes, including the construction/deepening of wells, the installation or enlargement of surface water inlets, or the construction of structures for the storage or diversion of water.

Drinking-Water Systems – *Safe Drinking Water Act*, section 31

- Establishment, alteration, extension or replacement of new or existing municipal drinking-water systems.

Sewage Works – *Ontario Water Resources Act*, section 53

- Establishment, alteration, extension or replacement of new or existing sewage works (including industrial waste water facilities).

Another important part of the regulatory framework is the MISA program, where MISA stands for the Municipal/Industrial Strategy for Abatement. Under MISA, abatement programs were established to reduce or eliminate the discharge of major specific toxic pollutants. The wastewater streams for each discharger covered by MISA were analyzed to identify the hazardous pollutants, and discharge standards were set using the "best available technology that was economically achievable" (BATEA) as criteria.

The regulations that support the MISA program are referred to collectively as the Effluent Monitoring and Effluent Limits regulations, under the *Environmental Protection Act*. These regulations apply to 17 of the facilities involved in the sweep. They cover the following sectors: petroleum refining; iron and steel; mining; pulp and paper; metal mining and refining; inorganic chemicals; organic chemicals; electric power generation; and industrial minerals. These sectors comprise the majority of Ontario's direct dischargers. The specific regulation references are:

- O.Reg. 63/95: Effluent Monitoring and Effluent Limits - Organic Chemical Manufacturing sector (as amended)
- O.Reg. 64/95: Effluent Monitoring and Effluent Limits – Inorganic Chemical Manufacturing Sector (as amended)
- O.Reg. 215/95: Effluent Monitoring and Effluent Limits – Electric Power Generating Sector (as amended)
- O.Reg 537/93: Effluent Monitoring and Effluent Limits – Petroleum Sector (as amended)

The regulations set acceptable levels of contaminants in discharges to watercourses on an industrial sector basis. The contaminants controlled and the limits of allowable discharges vary from sector to sector.

In addition to those mentioned above, SWAT was required to ensure the compliance of the inspected facilities with the following regulations:

- O.Reg. 101/94: Recycling and Composting of Municipal Waste
- O.Reg. 102/94: Waste Audits and Reduction Work Plans
- O.Reg. 103/94: Industrial, Commercial and Institutional Source Separation Programs
- O.Reg. 104/94: Packaging Audits and Packaging Reduction Work Plans
- O.Reg. 127/01: Airborne Contaminant Discharge Monitoring and Reporting
- O.Reg. 189: Refrigerants

- O.Reg. 347: General Waste Management
- O.Reg. 350: Lambton Industry Meteorological Alert
- O.Reg. 362: Waste Management – PCBs
- O.Reg. 455: Recovery of Gasoline Vapour in Bulk Transfers
- O.Reg. 675/98: Classification and Exemptions of Spills[11]
- O.Reg. 903: Wells

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[11] O.Reg. 675/98 provided clarification regarding the types of spills that had to be reported by individuals and companies to the Ministry of the Environment, with a focus on incidents that were likely to adversely affect the environment.

Backgrounder: Environmental SWAT Team

Ministry of the Environment's Environmental Protection Mandate

Ontario's environmental legislative and regulatory framework[12] seeks to ensure that protection of human health and the environment are effectively integrated into our economic and social activities. To be most effective – and ensure that Ontario's air, water and land are protected – environmental legislation and regulations must be effectively enforced.

The Ministry of the Environment seeks to make the best contribution possible to environmental protection. Creating a system that delivers fairness to those who comply with Ontario's environmental laws and strong enforcement to those who do not, provides a level playing field for businesses and a healthier ecosystem for all of us.

The Ministry fulfils its environmental protection mandate in many ways by:

- monitoring pollution and environmental trends in an effort to determine the effectiveness of its activities and to assess potential risk to human health and the environment;
- combining this information with emerging science and leading-edge innovations to enhance environmental protection based on the newest and best approaches to environmental management;
- helping to achieve Ontario's environmental goals through active inspection, investigation and enforcement while working with the regulated community to assist them in going beyond minimum requirements and engaging in continuous improvement of their environmental performance.

Ontario's Environmental SWAT Team

Within this broad mandate, the mission of the Environmental SWAT Team (SWAT) is to ensure compliance with Ontario's laws and foster a level playing field for business through strong, effective and fair enforcement.

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[12] The Ministry of the Environment ensures that all undertakings requiring approval are carried out in accordance with legislation and associated regulations, including the: *Ontario Water Resources Act; Environmental Protection Act; Pesticides Act; Environmental Assessment Act; Environmental Bill of Rights; Safe Drinking Water Act; Nutrient Management Act.*

SWAT uses a risk-based approach and its diagnostic capability to identify sectors that potentially present the greatest environmental and human health risk. During SWAT's in-depth inspection sweeps, it gathers critical information that allows the Ministry to gain a broader understanding of non-compliance issues to inform decision-making and future actions.

The Environmental SWAT Team (SWAT) is a specialized operational unit that can be rapidly deployed to address critical environmental issues. It complements the ongoing work of the Ministry, including that of its District Offices, in its inspection and enforcement activities.

Based on analysis of historical information gathered by the Ministry, SWAT undertakes risk-based sector inspection and enforcement to improve compliance in sectors where average non-compliance levels are very high or where the risk to human health and/or the environment is high. Major emphasis is placed on analyzing field-collected data to determine trends, compliance status and performance of regulated communities.

SWAT's Inspection Priorities

Using a risk assessment framework, SWAT selects specific sectors for inspection based on factors such as the sectors' history of non-compliance and the potential for major human health and/or environmental impacts. Using risk assessment tools together with historical data and on-the-ground knowledge of Ministry district staff, the Environmental SWAT Team further determines which companies within the selected sectors to inspect.

Subsequently, SWAT uses the information to develop inspection protocols for the inspectors as they engage in the sweep. Since its inception in 2000, the Environmental SWAT Team has completed inspection sweeps of the following sectors:

- Autobody Shops
- Auto Repair Garages
- Auto Wreckers/Recyclers
- Dry Cleaners
- Electroplaters/Metal Finishers/Metal Platers
- Hazardous Waste Transfer and Processing Facilities
- Vehicles that Transport Hazardous Liquid Industrial and Solid Waste, and Non-Hazardous Waste
- Primary Metals (casting facilities and foundries)
- Pesticide Applicators

- Pharmacies
- Printing Sector
- Septic Waste Haulers
- Recycling in Multi-unit Residential Buildings
- Septic Waste Haulers
- Used Tire Sites

Environmental SWAT Team Members

SWAT consists primarily of inspectors and program analysts:

- Inspectors arrive unannounced at inspection sites. Depending on the complexity of the sector, inspectors may spend anywhere from hours to days inspecting a company. During inspections, the inspectors survey the site, meet with employers, and may take samples of materials for testing. The inspectors also document their findings and provide copies of the inspection reports to the owners/operators of the facilities.
- Program analysts help determine which sectors to inspect, provide sector-specific research, identify companies with history of non-compliance and provide their technical analysis to the inspectors.

There are a number of investigators in the Investigations and Enforcement Branch dedicated to following up on SWAT-generated referrals.

Innovative Technologies

A state-of-the-art mobile computing system—Computer Assisted Mobile Enforcement Office (CAMEO) —was introduced in September 2002. CAMEO provides SWAT officers with online real-time access to information to support their inspections. Through the system's electronic checklist, inspectors are able to input data and automatically generate both inspection reports and Provincial Officer Orders. With this mobile computing capability, inspectors are better able to access the information they need to carry out their work, particularly in remote areas.

Knowledge Management

Online tracking and reporting (including number of inspections, sector levels of compliance, and changes in compliance levels through time) allows SWAT to assess the progress of compliance and enforcement activities and provides an effective feedback mechanism for continuous improvement. SWAT shares this 'diagnostics' information with other divisions of the Ministry and works collaboratively with these divisions while they use additional tools (e.g., compliance assistance programs) to help sectors improve their environmental compliance. SWAT also extensively engages in active outreach to stakeholders and sector associations as a way to encourage transparency and compliance within the regulated sectors.

Backgrounder: Sarnia District Office

Role of the Ministry's Sarnia District Office in Compliance

The District Office works closely with the Southwest Regional office and other branches of the Ministry to obtain specialized technical and scientific support as needed to support its operations. Its abatement staff provide environmental response on a 24/7 basis, working in conjunction with the Ministry's Spills Action Centre (SAC). District staff engaged in planned field inspections according to an annual schedule as well as responding to any reported incidents, as required.

In 2003-04, District Office staff conducted 168 inspections covering industrial sewage, municipal sewage, air, pesticides, biosolids (industrial and municipal) and waste sites[13] (hazardous and non-hazardous). Included in the 2003-04 District Office inspections workload were assessments of four areas operated by Imperial Oil Limited, including the industrial sewage works at the organic chemical manufacturing site and two hazardous waste transfer sites. At the time, those inspections found no issues of concern with respect to compliance with environmental criteria. These facilities were re-inspected during the Sarnia-area inspection sweep.

The District Office also participated in the ministry-wide Selected Targets for Air Compliance (STAC) program. In 2003-04, seven facilities in the Sarnia area were participating in STAC – Suncor, Imperial Oil Limited, Nova Chemicals - St. Clair site, Nova Chemicals – Corunna site, Ontario Power Generation (Lambton), Nova Chemicals - Moore site and Royal Polymers.

District Office staff actively participated along with the STAC review engineers in the review of all materials related to air emissions for the facilities selected to participate in STAC. Further, as part of STAC, the Sarnia District Office is participating in an innovative pilot risk management process being coordinated by the Ministry's Standards Development Branch (SDB). This process is intended to address air emissions where there are no established ministry limits, as well as to address other ministry standards and guidelines.

One pilot location is at the Imperial Oil Limited site in Sarnia where modeling has identified a need for the company to address the potential impact from benzene[14] emissions. To address this issue, the company has submitted Certificate of Approval applications to modify equipment and implement control measures to bring benzene emissions in line with the recommended limit for benzene recommended by the Ministry's Standards Development Branch.

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[13] The only commercial hazardous waste disposal site in Ontario lies within the area covered by the Sarnia District Office. This is one of only three such sites in Canada.

The Ministry response to issues arising from any STAC review is coordinated by the Sarnia District Office with further action taken, as required, by means of the environmental approval's process or through a Provincial Officer Order or Director's Order.

Sarnia District Office staff represents the Ministry at Public Liaison Committee meetings for landfill operations, industrial operations, and as part of the Remedial Action Plan process that includes efforts towards the de-listing of the St. Clair River as an Area of Concern[15]. These committees often serve as forums for the environmental concerns of the general public, as well as residents who live nearby the petrochemical facilities.

An example of how ongoing District Office operations support the environmental protection mandate of the Ministry is found in the events surrounding the massive power interruption of August 2003 which affected parts of Ontario and the United States. Before the power outage, the District Office had overseen the upgrades of municipal drinking water facilities as they went through the process of obtaining new Consolidated Certificates of Approval. As a result, most facilities were equipped with standby power and storage capacity, significantly reducing the impact of the blackout on drinking water supplies.

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[14] Benzene is a colorless liquid with a sweet odour. It evaporates into the air very quickly and dissolves slightly in water. It is highly flammable and is a widely used chemical formed from both natural processes and human activities. Long-term benzene exposure causes effects on the bone marrow and can cause anaemia and leukemia.

[15] Great Lakes Areas of Concern are locations identified by the Canada-United States Great Lakes Water Quality Agreement where environmental quality is significantly degraded and beneficial uses for both humans and wildlife are impaired. Examples of "beneficial use impairments" would include: loss of fish and wildlife habitat, degradation of fish and wildlife populations, undesirable algae and beach closings. In total there are 43 Areas of Concern in the Great Lakes Basin. Of these, 10 are Canadian and five are shared Canada-US Areas of Concern. Two Canadian locations have been cleaned up to the point where they have been removed from the list of Areas of Concern: Collingwood Harbour in 1994 and Severn Sound in 2003.

During the same power outage, the Sarnia District Office responded to a spill event by Royal Polymers Ltd. District Office staff sampled water supplies, provided modeling to track the potential impact and contacted health and municipal officials according to the local protocol. A Provincial Officer Order was issued to the company to take action to prevent any further occurrences. The company subsequently complied with the Order.

APPENDIX A: FINDINGS AND ACTIONS BY COMPANY FACILITY

FACILITIES INSPECTED DURING SARNIA SWEEP

- Air Liquide Canada Inc. (Gas plant)
- Air Products Canada Ltd. (Gas plant)
- Basell Canada Inc. (Chemical plant)
- Bayer Inc. (Chemical plant)
- BP Canada Energy Resources Company (Petroleum refinery/chemical plant)
- Cabot Canada Ltd. (Chemical plant)
- Chinook Corporation (Chemical plant)
- Dow Chemical Canada Inc. (Chemical plant)
- Enbridge Pipelines Inc. (Natural gas)
- Entropex Corporation (Plastic recycler)
- Ethyl Canada (Petroleum refinery/chemical plant)
- Fibrex Insulations Inc. (Chemical plant)
- ICI Canada Inc. (Wastewater Treatment Plant)
- Imperial Oil Ltd. (Petroleum refinery/chemical plant)
- Invista (Canada) Company (Chemical plant)
- Katoen Natie Canada Company (Plastic recycler)
- Lanxess Inc. (2 Chemical plants and 1 landfill site)
- Nova Chemicals (Canada) Ltd. (2 Chemical plants)
- Nova Chemicals Corporation (3 Chemical plants)
- Ontario Power Generation (Thermal generating station)
- Praxair Canada Inc. (2 Gas plants)
- Royal Polymers Limited (Chemical plant)
- SCU Nitrogen Inc. (Fertilizer plant)
- Shell Canada Products Ltd. (Petroleum refinery)
- Suncor Energy Products Inc. (Petroleum refinery/chemical plant)
- Terra International (Canada) Inc. (Chemical plant, fertilizer)
- TransAlta Energy Corporation (3 Co-generation electric stations)

This appendix provides a brief description of each facility inspected as part of the Environmental SWAT Team's inspection sweep in the Sarnia area, as well as its sound business practices and related inspection findings. An aerial photograph (also referred to as an "orthophoto") of each facility accompanies the text. These orthophotos provide detailed visual information used to plan for, and execute, the inspections. Where the orthophoto covers an area or facility that is not part of the inspection (e.g., owned by another company), a yellow line identifies the facility that is the subject of the inspection.

Note: An "orthophoto" is an aerial image that has undergone a process of "orthorectification" to correct for the effects of camera lens tip and tilt, image scale variations, etc., giving the user the positional accuracy of a map.

AIR LIQUIDE CANADA INC.

Site Location: 60 Bickford Line, Courtright

Inspection Report: 1-9UST

Type of Facility: Gas plant

Operations: Receives carbon dioxide gas from Terra International through an underground pipeline and condenses it into liquid carbon dioxide. Also receives cooling water from Terra International for use in their processes.

Associations: None identified.

Inspection Date: September 23, 2004

Sound Business Practices:

- Company follows Effluent Monitoring and Effluent Limits regulations guidelines although not Effluent Monitoring and Effluent Limits regulated.

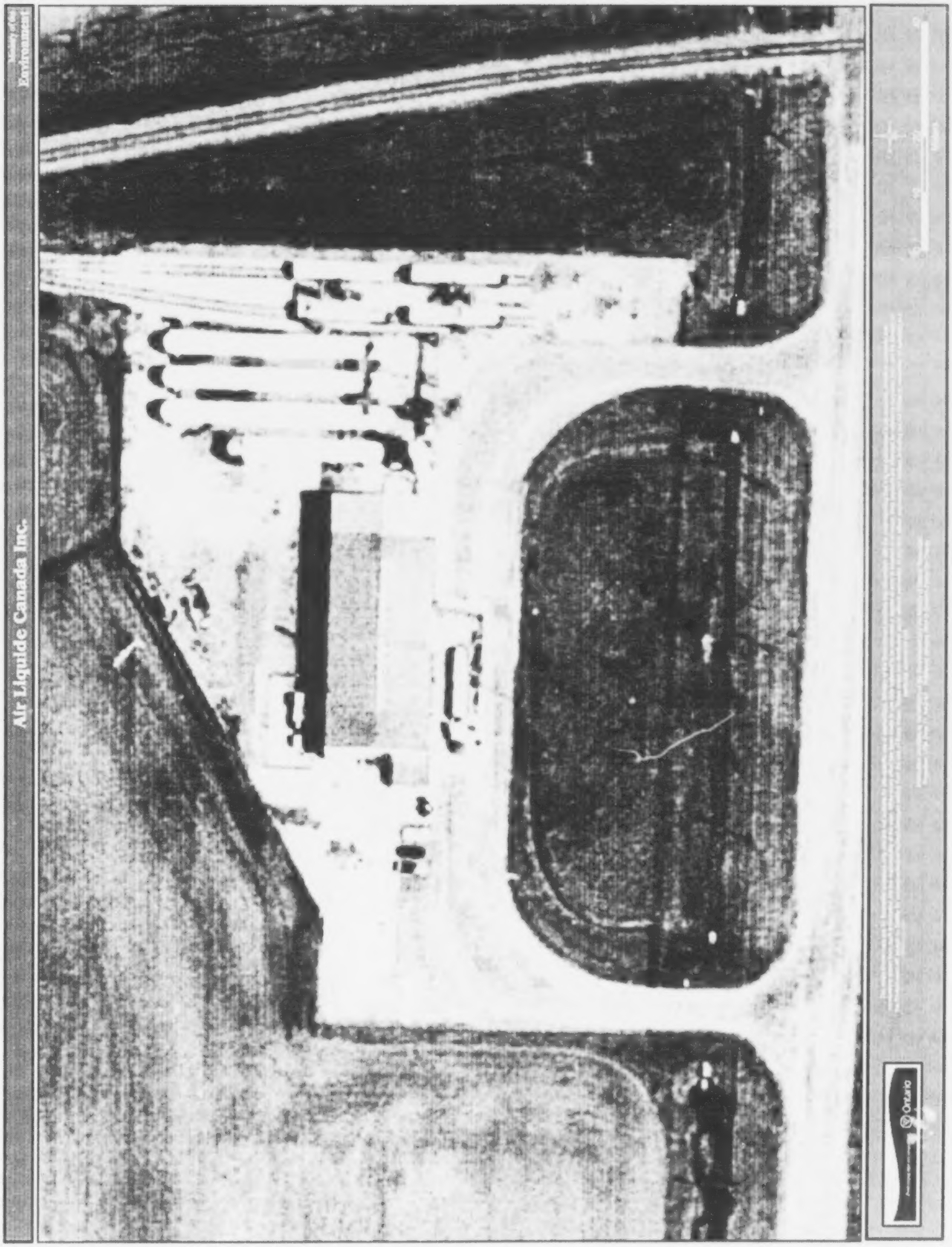
Issues of Concern:

- Generates solvent waste, but not registered as a generator of solvent wastes;
- Solvent wastes mixed with waste oils;
- Waste stored longer than 90 days without notifying MOE, as required;
- Certificates of Approval issued to company do not bear company name.

Action: Provincial Officer Order served on January 20, 2005; requirements on company included:

- Register as a generator of solvent wastes with Environmental Monitoring and Reporting Branch;
- Show how it characterized solvent wastes;
- Cease blending waste solvents and waste oils.

Compliance Status: Completed.


Air Liquide Canada Inc.
Ministry of the Environment
Ontario

AIR PRODUCTS CANADA LTD.

Site Location: 20 Indian Road South, Sarnia

Inspection Report: 1-9ULU

Type of Facility: Gas plant

Operations: Receives hydrogen gas from Nova Chemicals in Corunna and condenses it into liquid hydrogen. Extracts methane gas, which is sent back to Nova Chemicals for use as fuel.

Associations: ISO 9001 and 9002 certified

Inspection Date: May 16 -18, 2004

Sound Business Practices:

- Alarms that detect up to 5 ppm of contaminants in air (system shuts down if alarm tripped);
- Berms around waste tanks.

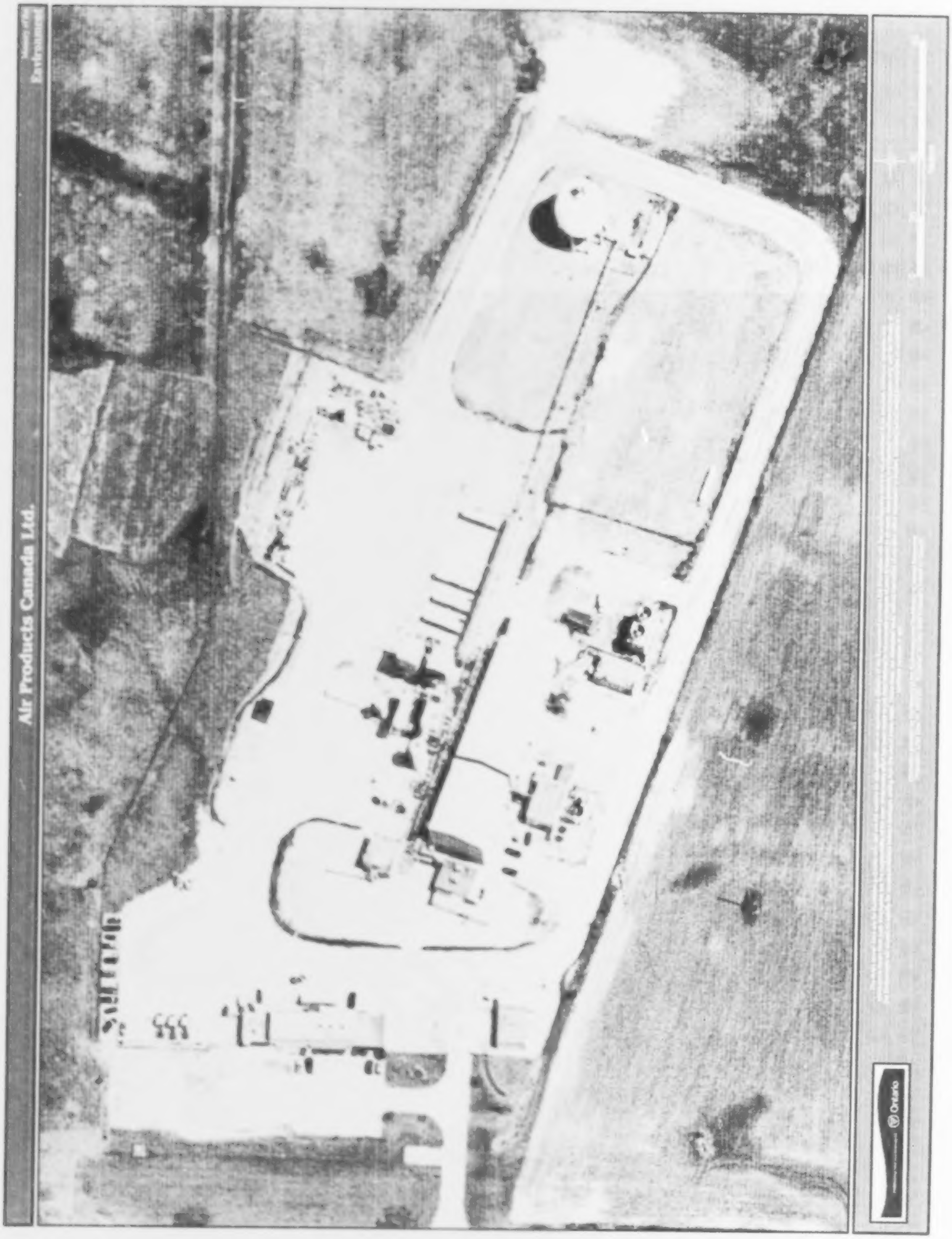
Issues of Concern:

- Fugitive emissions from pipes, including steam and nitrogen;
- Liquid underground waste stored longer than 90 days without notifying MOE, as required;
- Inadequate spill containment for the storage of waste oil drums.

Action: Provincial Officer Order served on July 13, 2004; requirements on company included:

- Characterize and dispose of liquid waste within contaminated area;
- Provide details and a plan for management of liquid waste;
- Apply to have current Certificate of Approval amended for address change.

Compliance Status: Complete.


Air Products Canada Ltd.
Ontario

BASELL CANADA INC.

Site Location: 339 LaSalle Road, Corunna

Inspection Report: 1-9UAI

Type of Facility: Chemical plant

Operations: Makes iropropyl alcohol and polypropylene nibs.

Associations: Member of Sarnia Lambton Environmental Association (SLEA), Canadian Chemical Producers' Association (CCPA)

Inspection Date: May 3 -12, 2004

Sound Business Practices: None Identified

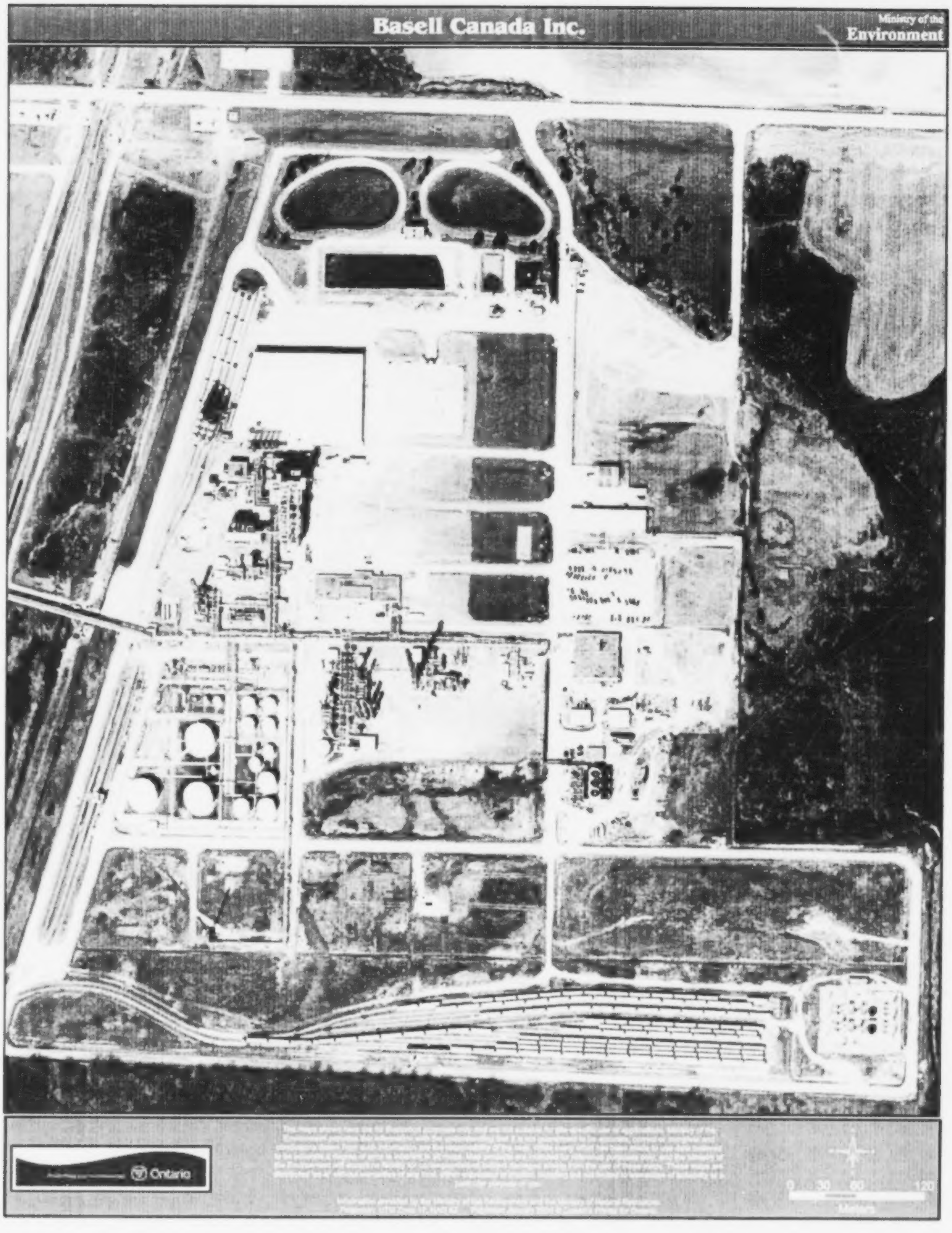
Issues of Concern:

- No Certificate of Approval for shipment of sewage to Shell Canada Products Ltd. for treatment;
- Several unapproved sources of emissions to air from laboratory fume hoods and welding garage;
- Emissions from a flare that exceed regulatory requirements during power outages;
- Groundwater contaminated with alcohol.

Action: Provincial Officer Order served on July 13, 2004; requirements on company included:

- Submit contingency plan for power outages;
- Apply for Certificate of Approval for emission sources;
- Apply to have existing Certificate of Approval amended to include sewage treatment plant.

Compliance Status: Complete.



Basell Canada Inc.
Ministry of the Environment
Ontario
0 30 60 120
Metres

BAYER INC.
(Formerly H.C. Starck Canada)

Site Location: 933 Vidal Street South, Sarnia

Inspection Report: 1-9UIO

Type of Facility: Chemical plant

Operations: Makes tungsten and nickel hydroxide.

Associations: Member of Canadian Chemical Producers' Association (CCPA)

Inspection Date: April 13 – July 8, 2004

Sound Business Practices: None identified.

Issue of Concern:

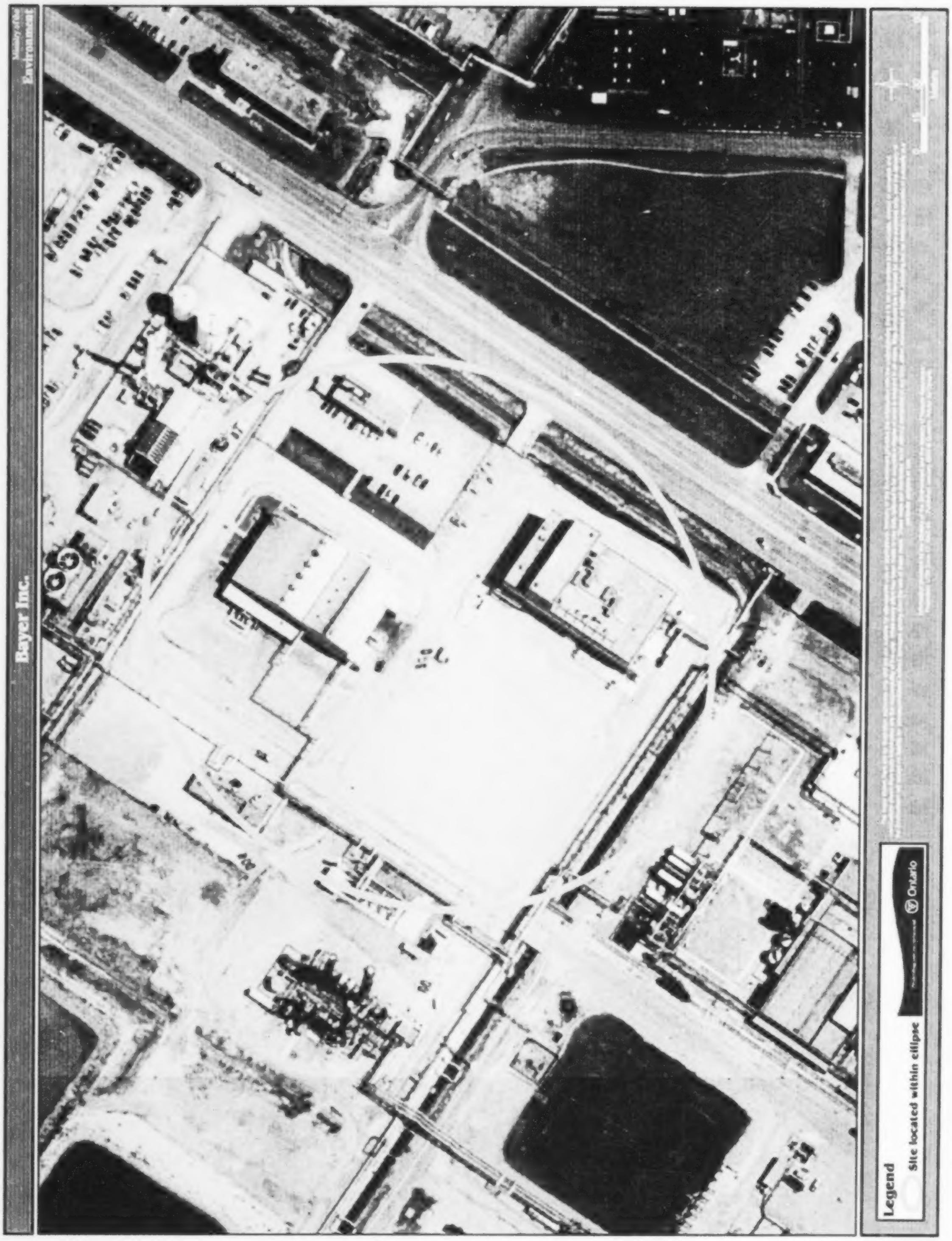
- Unapproved Installation of three fume hoods in the Tungsten Lab.

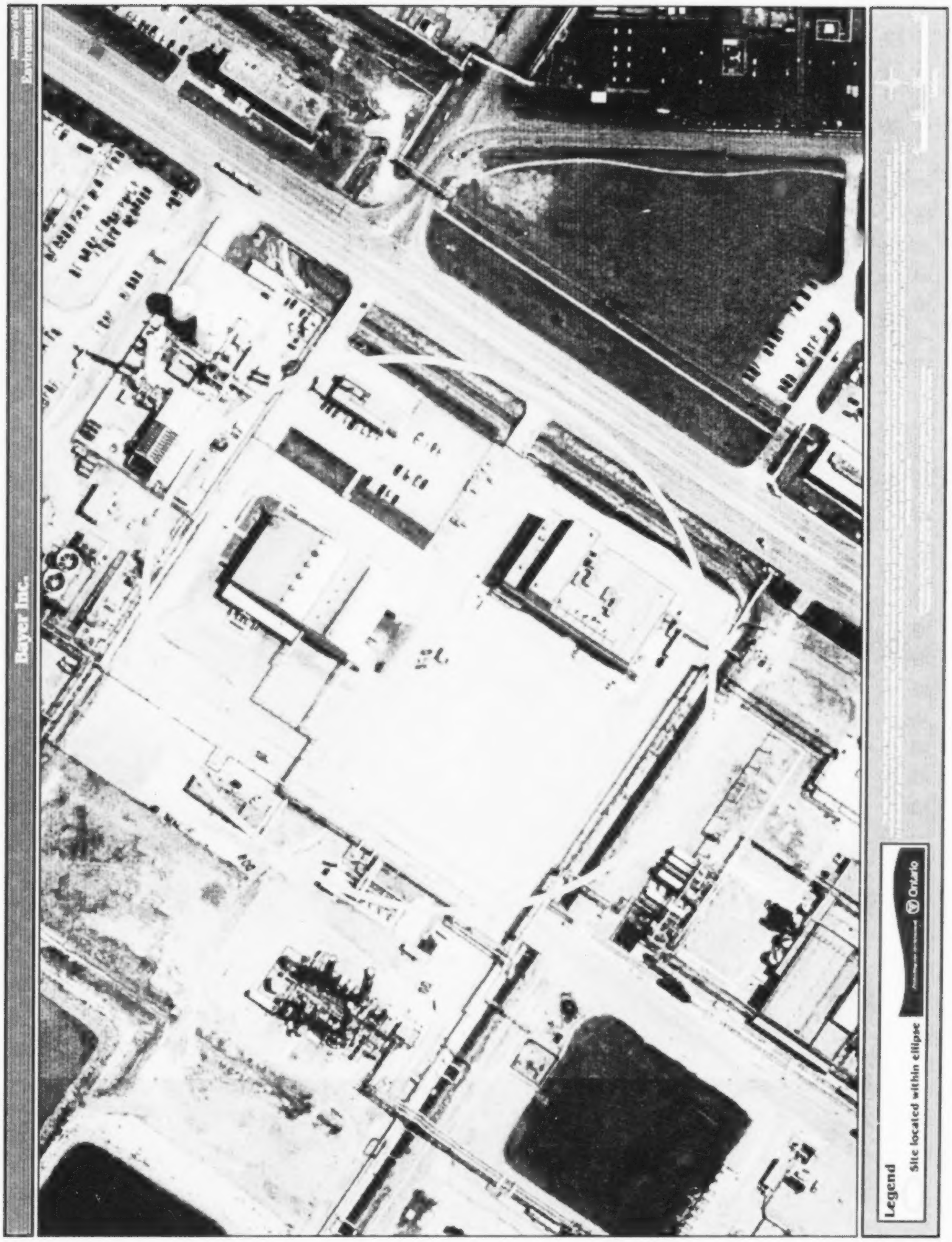
Action: Provincial Officer Order served on August 31, 2004; requirements on company included:

  - Apply for new Certificate of Approval for fume hoods.

Company requested review of Order on September 7, 2004.

Compliance Status: Complete.


Bayer Inc.
Ministry of the Environment
Legend
Site located within ellipse
Ontario


Bayer Inc.
Ministry of the Environment
Legend
Site located within ellipse
Ontario

BP CANADA ENERGY RESOURCES COMPANY

Site Location: 1182 Plank Road, Sarnia

Inspection Report: 1-9UB3

Type of Facility: Petroleum refinery/chemical plant

Operations: Refines oil and makes petroleum products.

Associations: Member of Sarnia Lambton Environmental Association (SLEA), Canadian Chemical Producers' Association (CCPA), Member of Responsible Care (CCPA), ISO 14001 certified

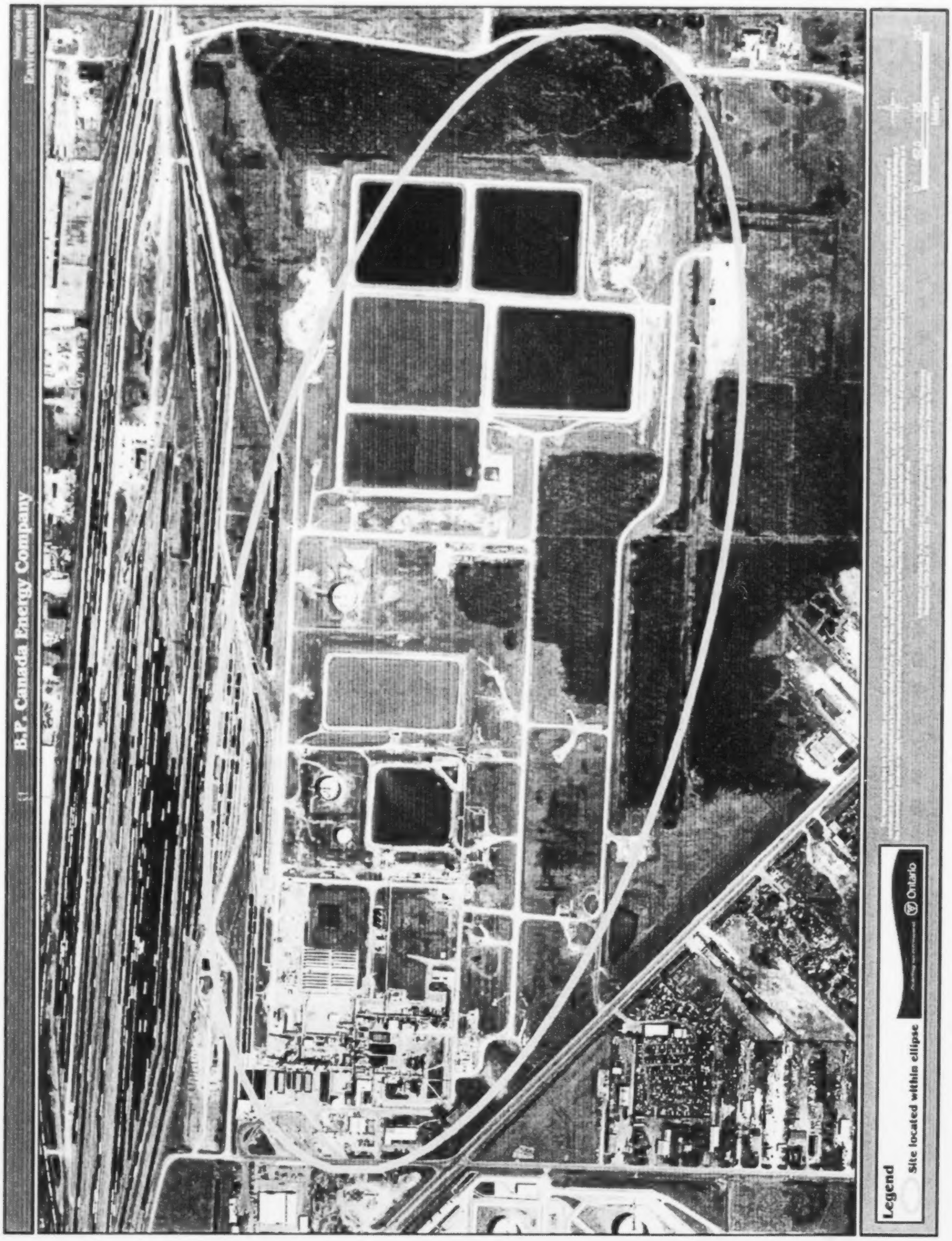
Inspection Date: August 16 -27, 2004

Sound Business Practices:
- Consolidating old Certificates of Approval;
- Dedicated on-site environmental staff;
- Developed spill management program;
- Formalized inspections of refinery equipment as per American Petroleum Institute (API).

Issues of Concern:
- No Certificate of Approval for several unapproved exhausts;
- Numerous manifesting errors and misclassification of wastes for shipping.

Action: Provincial Officer Order served on December 8, 2004; requirements on company included:
- Apply for Certificate of Approval for unapproved exhausts and any other unapproved sources of emissions to air;
- Evaluate characteristics of its wastes and/or file generator reports for wastes;
- Develop procedure to eliminate volume/weight errors on manifests.

Compliance Status: In progress.


B.P. Canada Energy Company
Ministry of the Environment
Legend
Site located within ellipse
Ontario

CABOT CANADA LTD.

Site Location: 800 Tashmoo Avenue, Sarnia

Inspection Report: 1-DQT9

Type of Facility: Chemical plant

Operations: Produces carbon black, primarily for reinforcing rubber goods, with the balance going into pigments and fillers for plastics, paints and inks.

Associations: Member of Sarnia Lambton Environmental Association (SLEA)

Inspection Date: February 24 – March 5, 2004

Sound Business Practices:

- All process water directed to lagoon and treated through sand filter;
- Tank farm bermed;
- Environmental and health and safety manager on staff.

Issues of Concern:

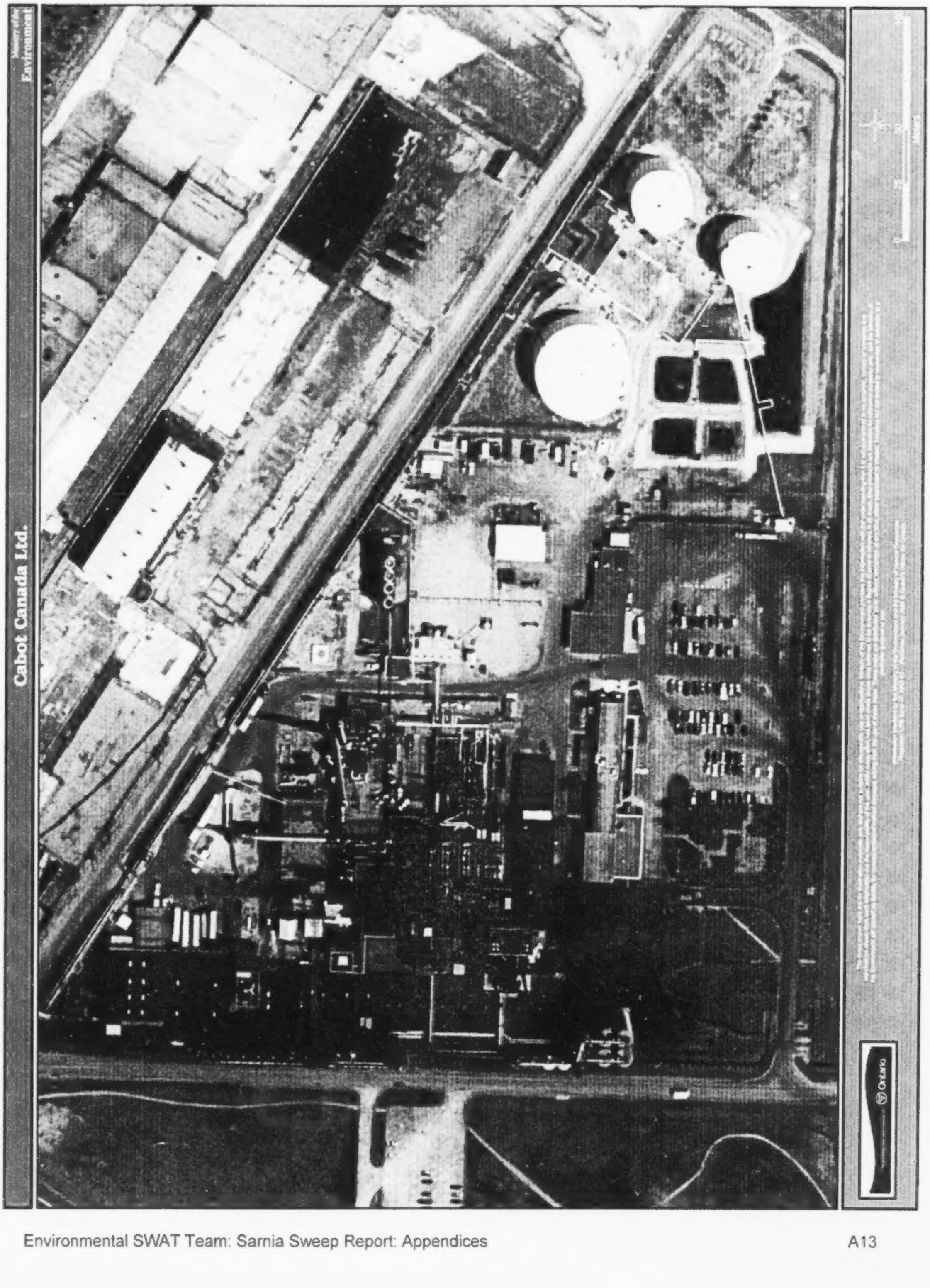
- Many unapproved sources of emissions to air and other related violations;
- Unapproved equipment for handling wastes. Also, inaccurate drawings of sewer system, no emergency pumping system for effluent pumping station, failed to create required manual;
- Laboratory waste not characterized, registered or disposed of properly;
- Many waste sampling requirements not being followed;
- Questionable classification of wastes;
- No waste reduction plan created, no 2003 waste audit submitted;
- Never decommissioned as a PCB site after waste removed in 1999 following Director's Order in 1998;
- Spill contingency plans missing or inadequate.

Action: Provincial Officer Order served on April 8, 2004; requirements on company included:

- Characterize and improve management of subject waste manifests;
- Perform a source separation study and a waste audit, prepare waste reduction plans;
- Provide documentation for decommissioning a PCB site;
- Re-evaluate environmental Summary Dispersion Model;
- Undertake spill management and contingency planning;
- Apply for new Certificate of Approval (Air);
- Apply to have two existing Certificates of Approval (Air) amended.

Company requested review of Order on April 15, 2004. Director's Order served on April 27, 2004, to enforce original Order.

Compliance Status: Complete.



Cabot Canada Ltd.

CHINOOK CORPORATION LIMITED PARTNERSHIP

Site Location: 224 Holt Line West, St. Clair

Inspection Report: 1-9U3D

Type of Facility: Chemical plant

Operations: Makes chemicals used in water treatment, animal feed and pharmaceuticals, including methylamines, choline chloride and other choline-derived products.

Associations: Member of Sarnia Lambton Environmental Association (SLEA), Canadian Chemical Producers' Association (CCPA)

Inspection Date: July 12 -16, 2004

Sound Business Practices:

- Dedicated environmental officer on site.

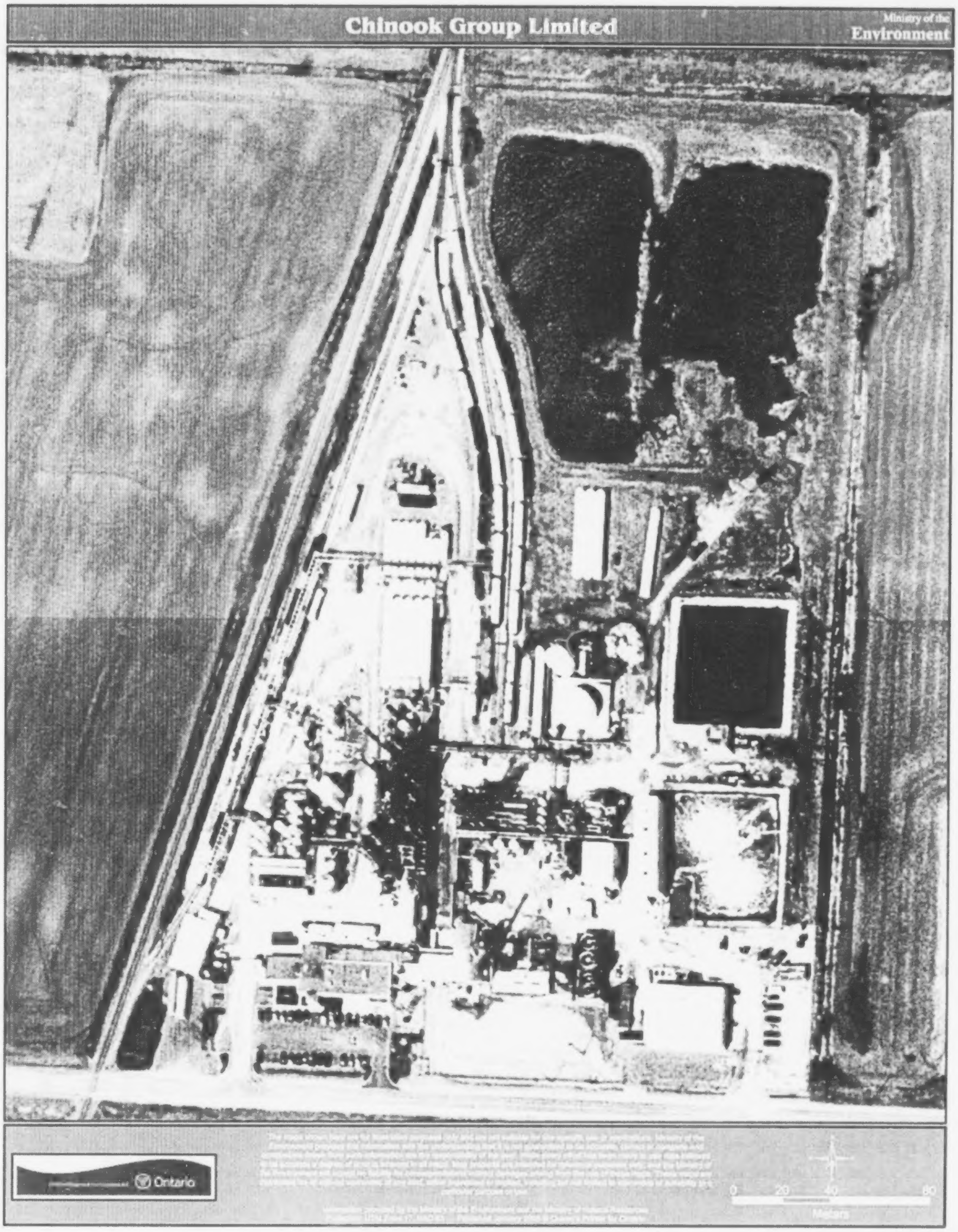
Issues of Concern:

- Several unapproved sources of emissions to air without Certificates of Approval;
- Inadequate laboratory analysis records;
- Incomplete registration of wastes;
- Potential contamination of area ground waters.

Action: Provincial Officer Order served on January 20, 2005; requirements on company included:

- Apply to have current Certificate of Approval amended to include equipment causing emissions to air;
- Comply with Ontario Regulation 347 about properly classifying waste and providing correct generator names on manifests;
- Submit plan for irrigation pond
- Comply with Certificate of Approval (sewage).

Compliance Status: In progress.



Chinook Group Limited
Ministry of the Environment
Ontario
0
20
40
80
Meters

DOW CHEMICAL CANADA INC.

Site Location: 1425 Vidal Street South, Sarnia

Inspection Report: 1-9U9Z

Type of Facility: Chemical plant

Operations: Makes polystyrene, polyethylene, epoxy resins, and polyols.

Associations: Member of Sarnia Lambton Environmental Association (SLEA), Canadian Chemical Producers' Association (CCPA), Chemical Valley Emergency Coordinating Organization (CVECO)

Inspection Date: August 30 – September 21, 2004

Sound Business Practices:

- Electronic maintenance catalogue and reporting;
- Air monitoring for entire site (individual facilities treated on global emission scale);
- Information sharing between facilities globally.

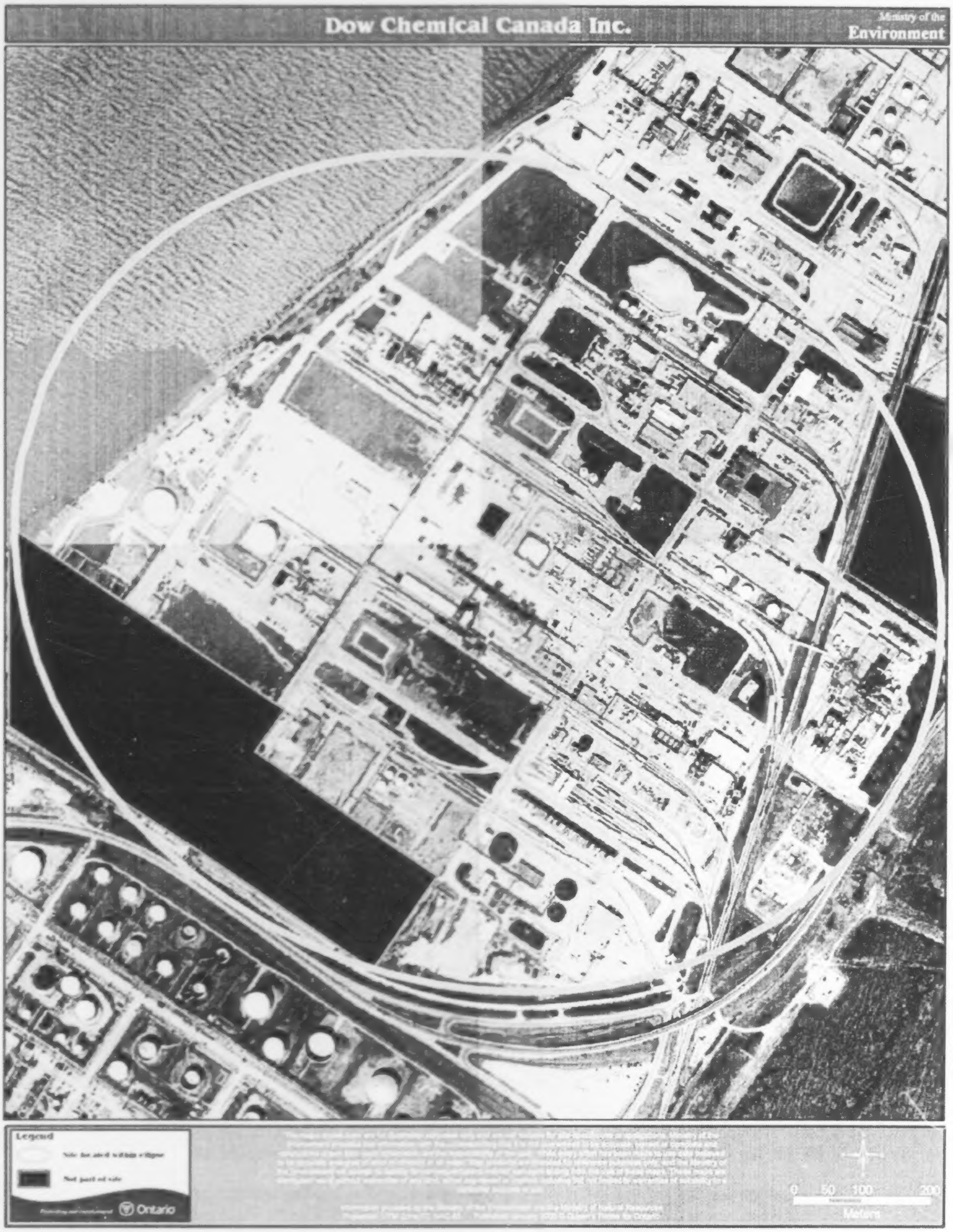
Issues of Concern:

- Numerous Effluent Monitoring and Effluent Limits Regulations Issues under Ontario Regulation 63/95;
- Waste reduction plans under Ontario Regulation 102.
- Exceeded daily maximum PTTW amount on one single day.
- Ontario Regulation 347 manifesting, waste characterization and procedural deviation from manuals.
- Certificate of Approval requiring amendments or new Certificates of Approval. Company currently has more than100 valid Certificates of Approval.

Action: Provincial Officer Order served on April 12, 2005; requirements on company included:

- Have current Certificate of Approval for air amended;
- Comply with existing sewage Certificate of Approval;
- Properly characterize waste according to Generator Registration Guideline Manual.

Compliance Status: To be determined. Order issued April 12, 2005.


Dow Chemical Canada Inc.
Ministry of the Environment
Legend
Site located within ellipse
Not part of site
Ontario
0 50 100 200
Meters

ENBRIDGE PIPELINES INC.

Site Location: 1010 Plank Road, Sarnia

Inspection Report: 1-9UTM

Type of Facility: Natural Gas

Operations: Operates (in Canada and the U.S.) the world's longest crude oil and liquids pipeline system.

Associations: None identified.

Inspection Date: August 26 - 27, 2004

Sound business Practices: None identified.

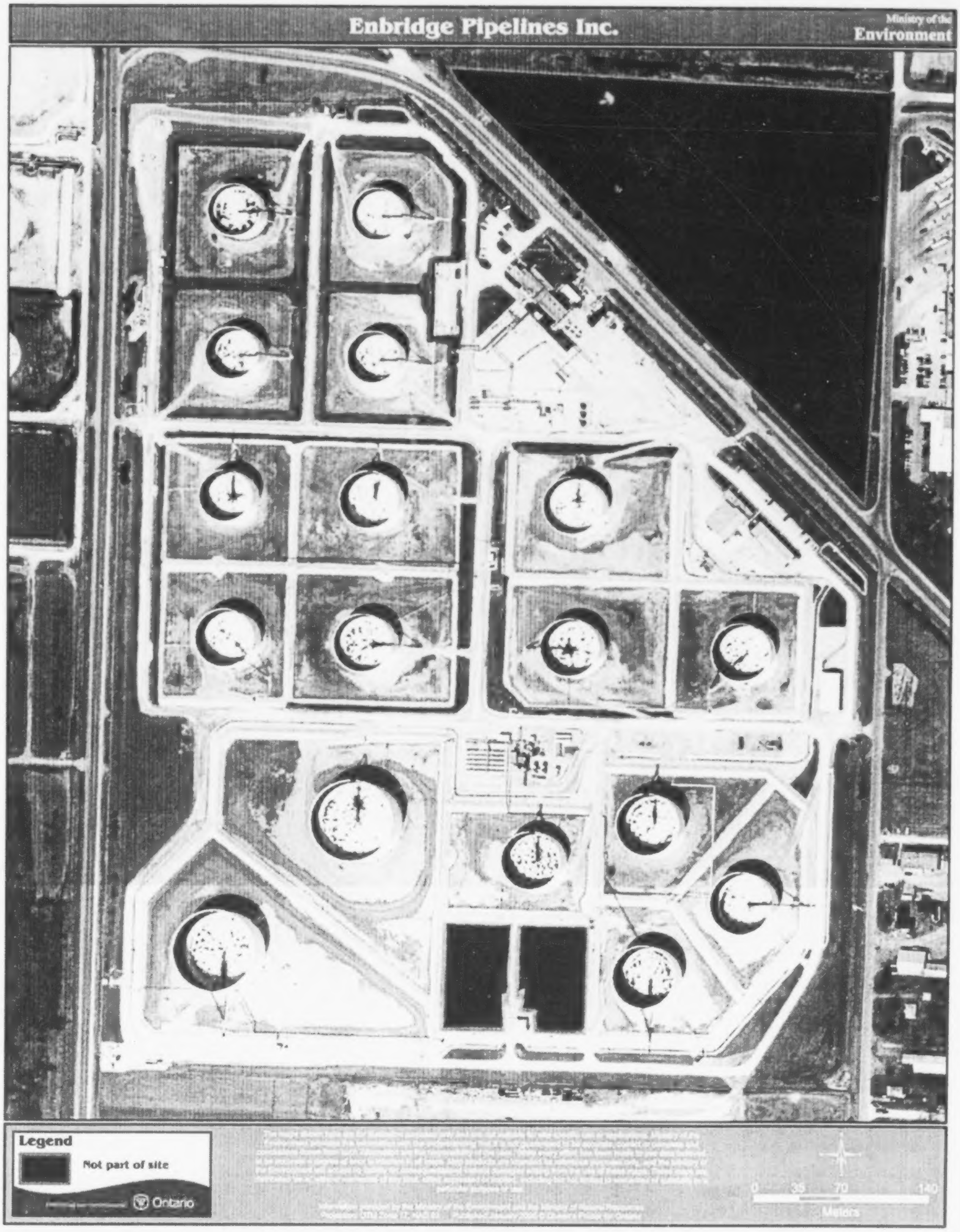
Issues of Concern:

- Unregistered wastes being produced, collected and stored on site;
- Unapproved equipment discharging air emissions (welding fume hoods, crude oil storage tanks, sample room fume hood, back-up generator);
- Operations of industrial sewage works not fully covered by existing Certificate of Approval.

Action: Provincial Officer Order served on January 20, 2005; requirements on company included:

- Comply with Ontario Regulation 347 regarding subject waste;
- Apply to have Certificates of Approval (Air and Sewage) amended.

Compliance Status: In progress under Director's Order.



Enbridge Pipelines Inc.

ENTROPEX CORPORATION

Site Location: 1271 Lougar Street, Sarnia

Inspection Report: 1-9U3X

Type of Facility: Plastic recycler

Operations: Accepts plastic from Sarnia's municipal recycling program and other sources for processing into pellets.

Associations: ISO 14001 certified

Inspection Date: April 27, 2004

Sound Business Practices:

- On-site environmental health and safety officer with five dedicated staff.

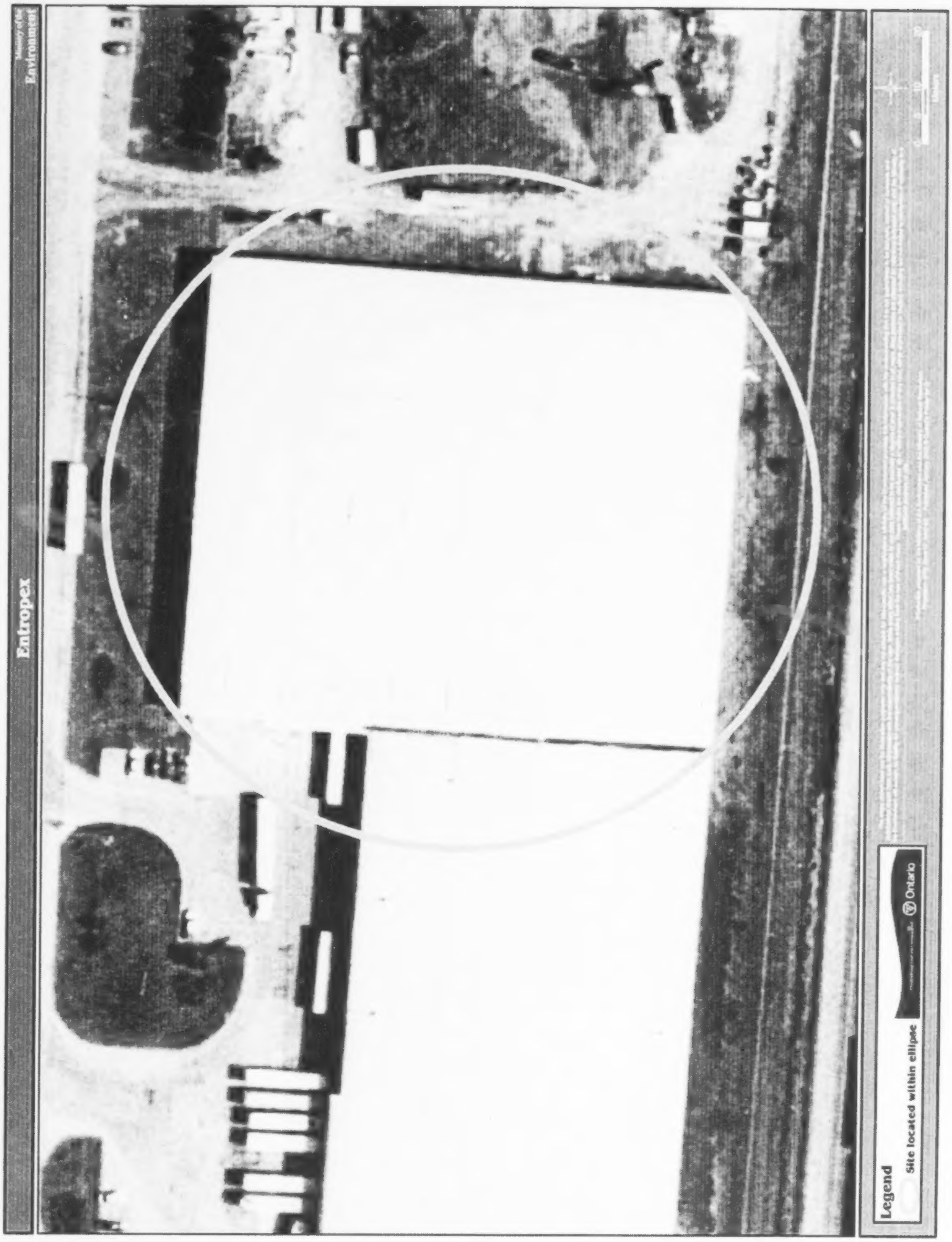
Issues of Concern:

- Unapproved equipment alterations;
- Subject waste remaining on site for more than 90 days without proper reporting to the Ministry.

Action: Provincial Officer Order served on August 31, 2004; requirements on company included:

- Comply with Ontario Regulation 127, by report, as required;
- Comply with Ontario Regulation 347 for storage reporting;
- Apply to have Certificate of Approval amended for emissions to air.

Compliance Status: Complete.


Ministry of the Environment
Entropex
Legend
Site located within ellipse
Ontario

ETHYL CANADA INC.

Site Location: 220 St. Clair Parkway, Moore

Inspection Report: 1-9UK5

Type of Facility: Petroleum refinery/chemical plant

Operations: Blends fuel and lubricant additives; produces diesel fuel octane improver.

Associations: Member of Sarnia Lambton Environmental Association (SLEA), Canadian Chemical Producers' Association of Canada (CCPA); ISO 9002 certified

Inspection Date: May 31 – June 4, 2004

Sound Business Practices:

- Secondary containment for storm water (kept on site until tested, all ditches gated on final discharge);
- Has applied for site-wide comprehensive Certificate of Approval for air and sewage conditions.

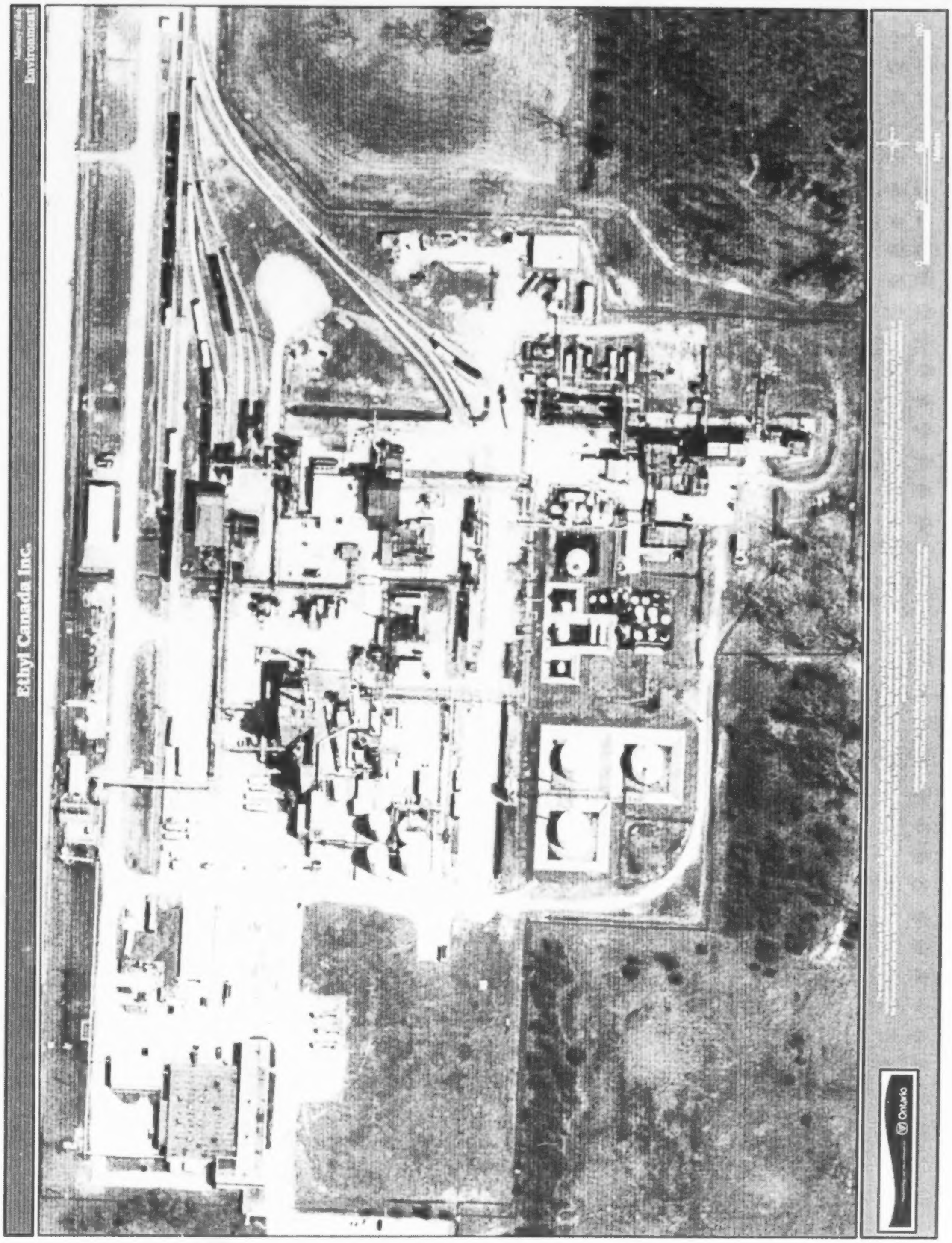
Issues of Concern:

- No Certificates of Approval for three vents on lab roof;
- Certificate of Approval for sewage works not amended to include on-site industrial laundry;
- Improper manifesting of hazardous wastes.

Action: Provincial Officer Order served on August 31, 2004; requirements on company included:

- Apply to have existing Certificate of Approval amended to include equipment on lab roof;
- Apply to have existing Certificate of Approval amended to include on-site industrial laundry;
- Properly characterize waste according to Generator Registration Guideline Manual.

Compliance Status: Complete.


Ethyl Canada Inc.
Ministry of the Environment
Meters
Ontario

FIBREX INSULATIONS INC.

Site Location: 561 Scott Road, Sarnia

Inspection Report: 1-9UJN

Type of Facility: Chemical Plant

Operations: Makes rock wool board, pipe and blanket insulations, rock wool roof insulations, rock wool marine insulations.

Associations: Member of Sarnia Lambton Environmental Association (SLEA)

Inspection Date: May 10 -13, 2004

Sound Business Practices: None identified.

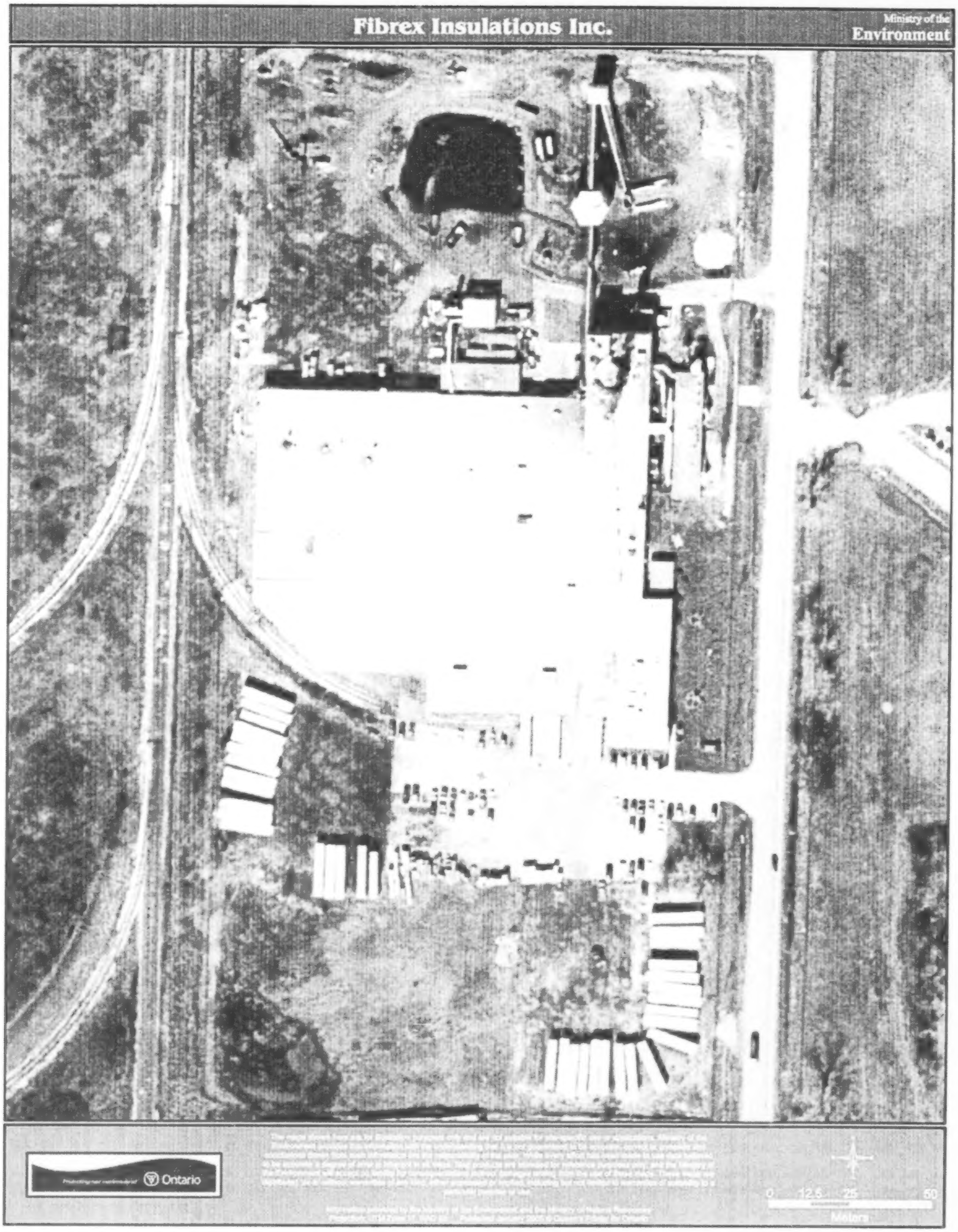
Issues of Concern:

- Fugitive emissions escaping to air through doors and vents;
- Inadequate containment of, and management plan for, hoses and piping from storm-water pond;
- No Certificate of Approval for on-site sewage works.
- Inadequate spill contingency and containment plans.

Action: Provincial Officer Order served on August 31, 2004; requirements on company included:

- Reduce emissions to air and apply to have existing Certificate of Approval amended accordingly;
- Apply for two Certificates of Approval for sewage works (discharge of storm water and for process water pond);
- Prepare spill contingency and containment plans.

Compliance Status: Complete.


Fibrex Insulations Inc.
Ministry of the Environment
Ontario
0
12.5
25
50
Meters

ICI CANADA INC.

Site Location: 213 Bickford Line, Lambton Shores

Inspection Report: 1-9UM9

Type of Facility: Wastewater Treatment Plant

Operations: Treats industrial sewage.

Associations: None identified.

Inspection Date: April 13 – June 16, 2004

Sound Business Practices:

- Batch discharges tested prior to discharge;
- Wetlands used for final polishing, with site being made into conservation area with Ducks Unlimited.

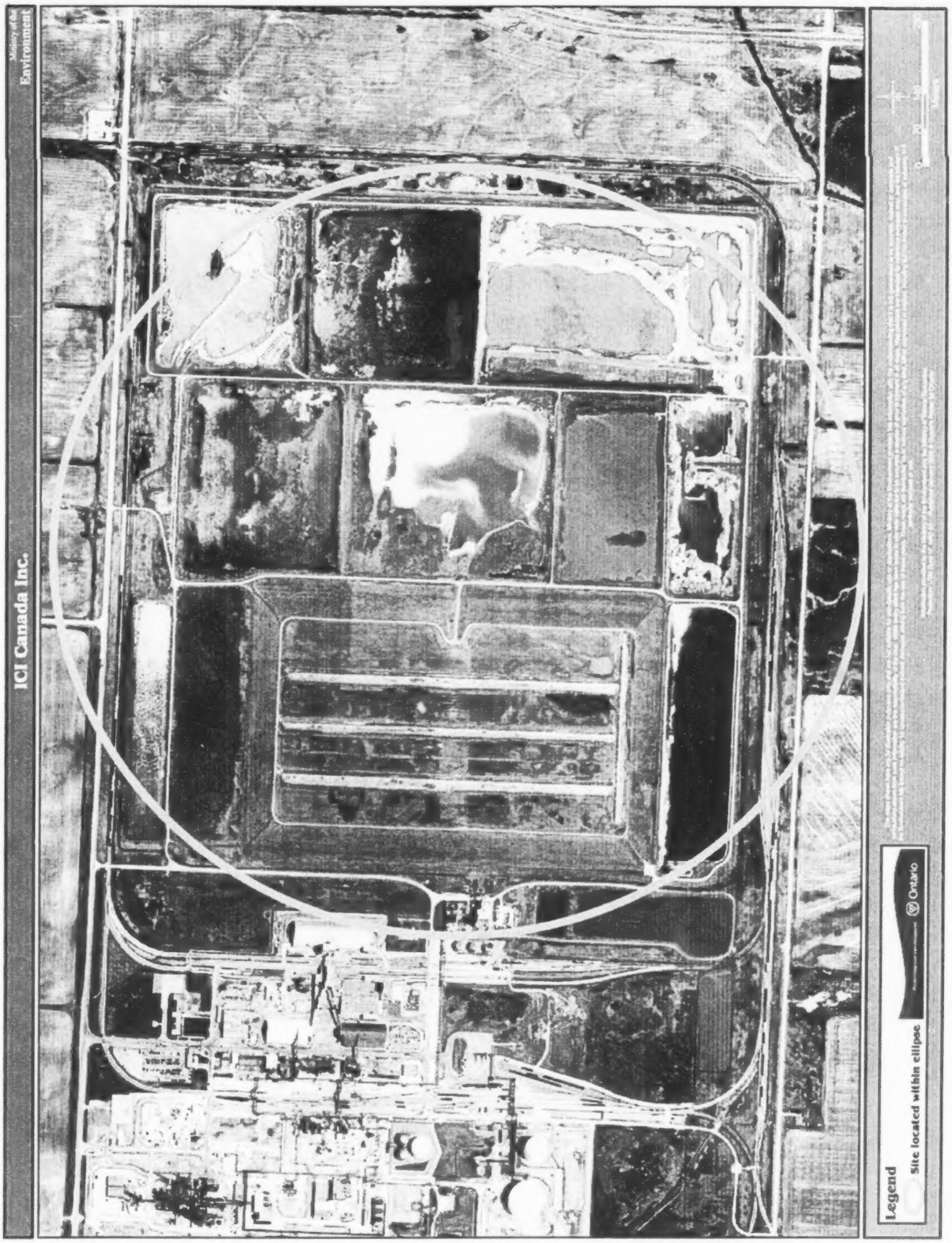
Issues of Concern:

- Several pieces of equipment not covered by current Certificate of Approval, including one discharging ammonia fumes;
- Storage of waste oils for longer than 90 days (two years) without notifying MOE as required;
- Several groundwater monitoring wells poorly maintained and not covered by current Certificate of Approval;
- Manual for sewage operations incomplete regarding vegetative cover;
- Calibration and pH monitoring records not kept on site and available for inspection as required.

Action: Provincial Officer Order served on August 31, 2004; requirements on company included:

- Apply for Certificate of Approval for equipment causing emissions to air;
- Comply with requirements for storing waste oils;
- Comply with requirements for groundwater monitoring wells;
- Revise and keep sewage operations manual up to date as required by existing Certificate of Approval;
- Keep pH monitoring and calibration records on site and available for inspection.

Compliance Status: In progress.


ICI Canada Inc.
Ministry of the Environment
Legend
Site located within ellipse
Ontario

IMPERIAL OIL LTD.

Site Location: 602 South Christina Street, Sarnia

Inspection Report: 1-9MI0

Type of Facility: Petroleum refinery/chemical plant

Operations: Refines oil and makes petroleum products.

Associations: Member of Sarnia Lambton Environmental Association (SLEA), Canadian Chemical Producers' Association (CPPA), Canadian Petroleum Products Institute (CPPI)

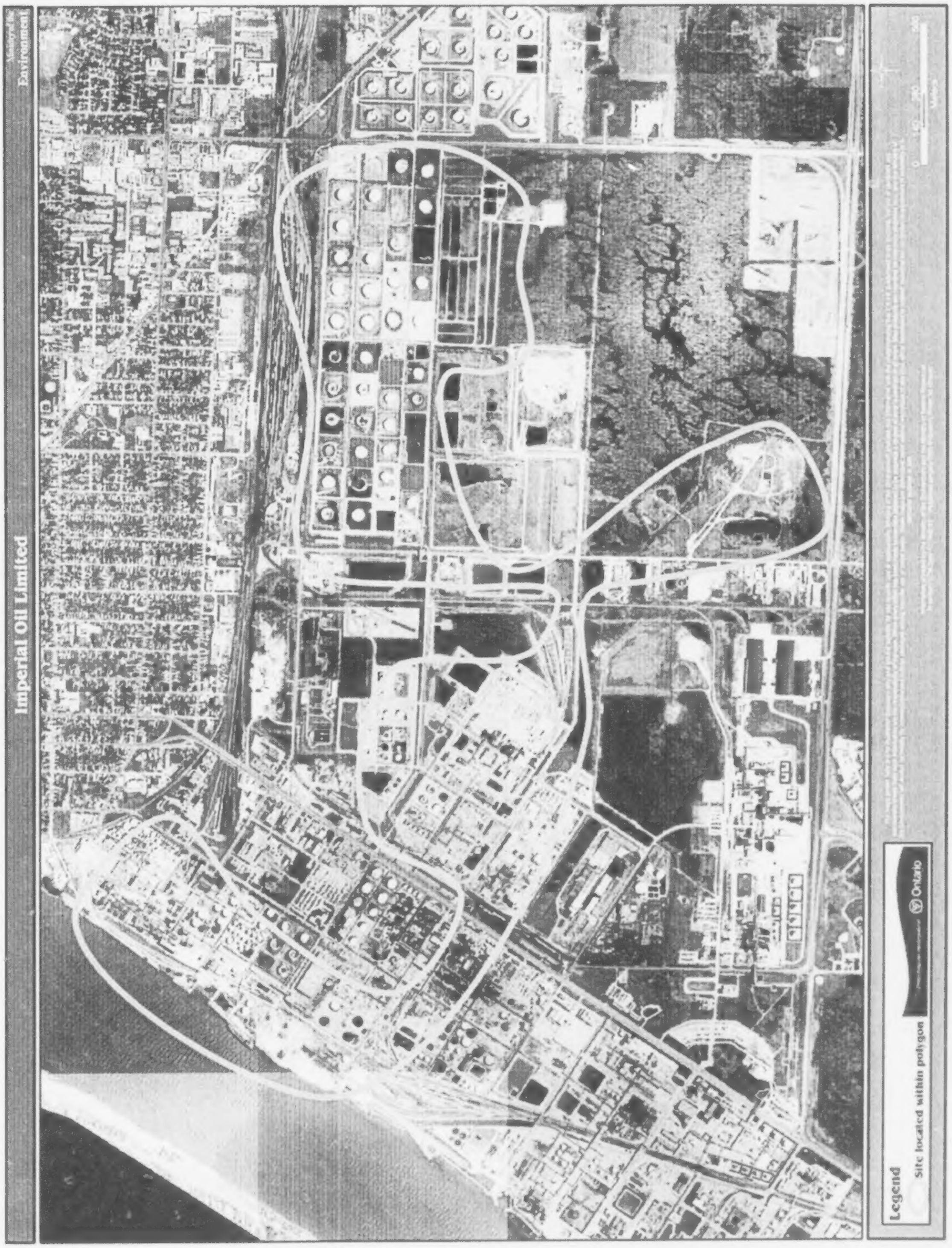
Inspection Date: September 27 – December 7, 2004

Sound Business Practices: None identified.

Issues of Concern:
- Equipment not approved by current Certificate of Approval;
- All tanks potentially in use not included in Consolidated Certificate of Approval for sewage;
- Spreading (land farming) of waste during unapproved times and conditions;
- Wells not in good repair.

Action: Provincial Officer Order served on April 12, 2005; requirements on company included:
- Have current Certificate of Approval for air amended;
- Have current Certificate of Approval for sewage amended:
- Land-farm sludge in accordance with Certificate of Approval.
- Have a qualified person maintain the wells.

Compliance Status: To be determined. Order issued April 12, 2005.


Imperial Oil Limited
Ministry of the Environment
Legend
Site located within polygon
Ontario

INVISTA (CANADA) COMPANY

Site Location: 291 Albert Street, St. Clair

Inspection Report: 1-ABA5

Type of Facility: Chemical plant

Operations: Modifies polymers by adding various additives through an extrusion process in order to alter their properties for specialized applications.

Associations: Member of Sarnia Lambton Environmental Association (SLEA)

Inspection Date: April 20 – May 3, 2004

Sound Business Practices:

- In-house technical evaluation of equipment on a regular basis;
- Contingency planning (what-if scenarios);
- Hazardous operability (HAZOP) studies.

Issues of Concern:

- Inadequate procedures for bag house maintenance;
- No spill contingency plan for storage and handling of chemicals;
- No written procedures for operating and maintaining equipment.

Action: Provincial Officer Order served on July 13, 2004; requirements on company included:

- Establish adequate maintenance procedures for bag house;
- Develop a contingency plan for handling chemicals;
- Complete equipment procedures.

Compliance Status: Complete.

Invista (Canada) Company
Ministry of the Environment
Ontario
Metres

KATOEN NATIE CANADA COMPANY

Site Location: 475 Hill Street, Corunna

Inspection Report: 1-AG17

Type of Facility: Plastic recycler

Operations: Processes plastic pellets and powder.

Associations: None identified.

Inspection Date: April 27, 2004

Sound Business Practices: None identified.

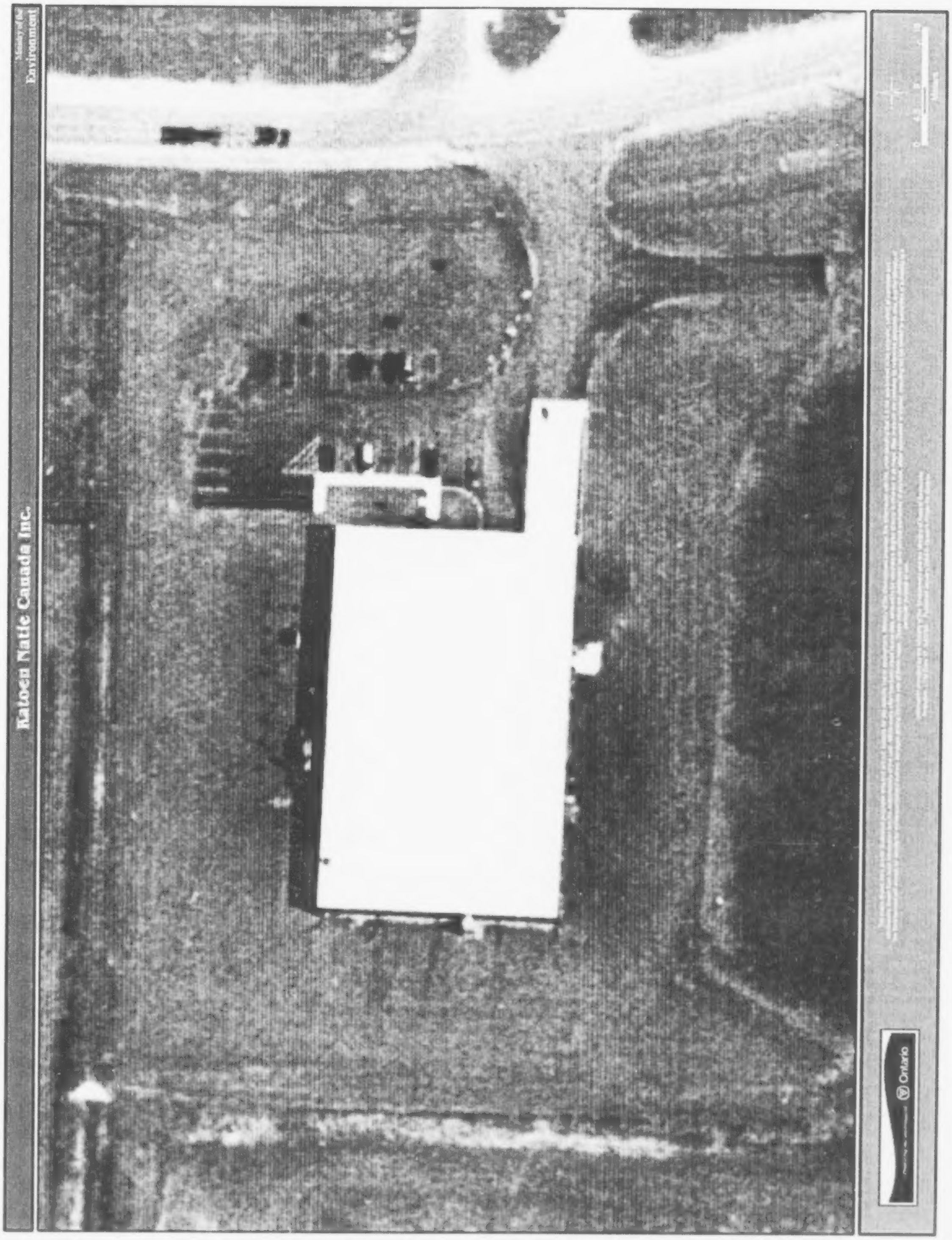
Issues of Concern:

- Not reporting on air emissions, as required.
- Not registered as a waste generator;
- Poor waste management procedures and record-keeping, with on-site wastes (oils, solvents, hydraulic fluids) not being properly identified, stored and transported.

Action: Provincial Officer Order served on July 13, 2004; requirements on company included:

- Submit report on emissions to air;
- Store, manifest and ship all wastes, as required.

Compliance Status: Complete.


Katoen Natie Canada Inc.
Ministry of the Environment
Ontario

LANXESS Inc.
(Formerly Bayer Inc., Butyl I Plant)

Site Location: 1265 Vidal Street South, Sarnia

Inspection Report: 1-9U2X

Type of Facility: Chemical plant

Operations: Rubber manufacturing

Associations: Member of Sarnia Lambton Environmental Association (SLEA)

Inspection Date: April 13 – July 8, 2004

Sound Business Practices:

- Auto samplers for hydrocarbons on non-contact cooling water;
- Ability to redirect cooling water in case of spills;
- All process units and drains connected to Biox treatment plant;
- All discharge devices labeled;
- Ability through redundant systems to lock out process equipment in case of spill;
- Discharge of some processes to flares;
- Process hazard analysis done annually.

Issues of Concern:

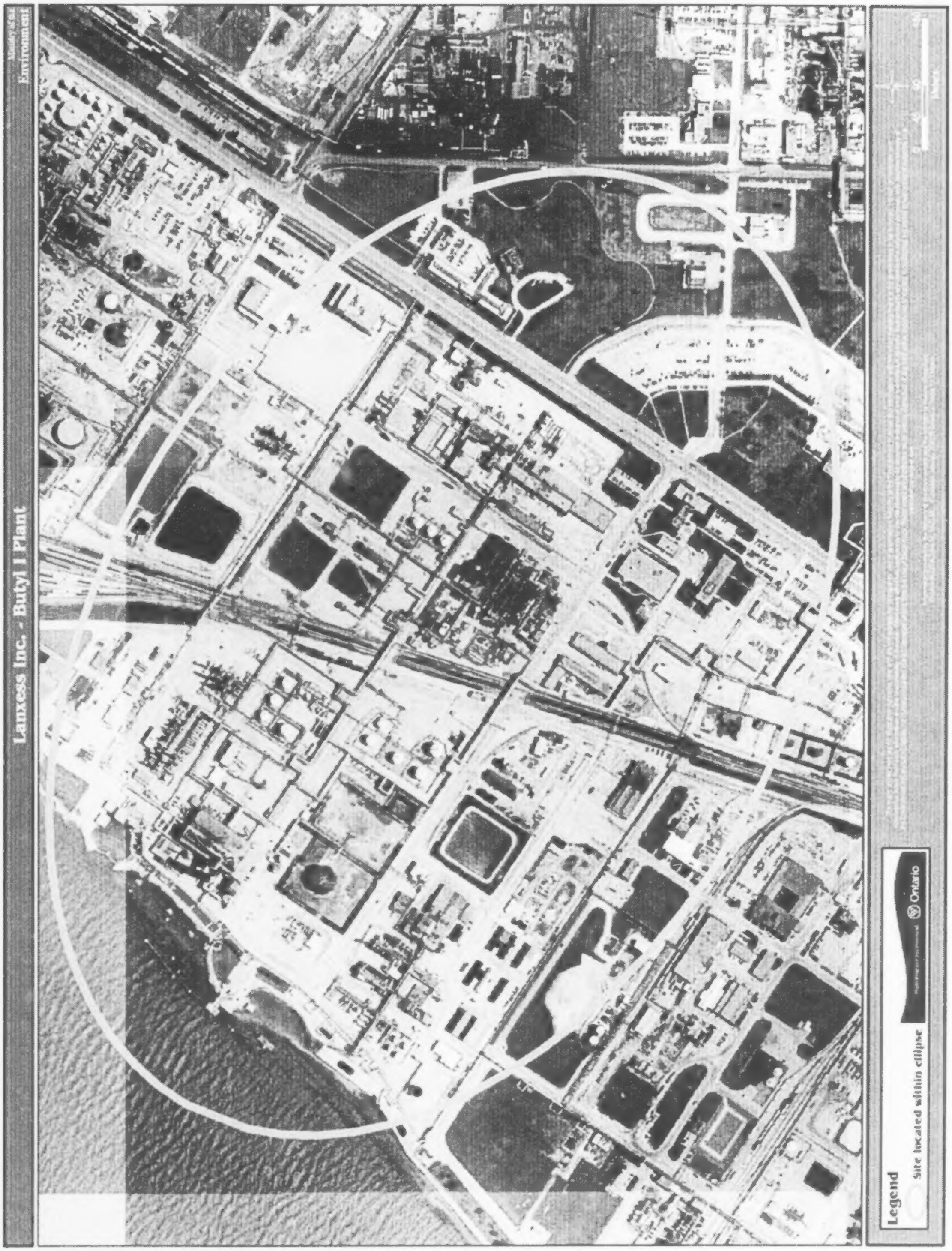
- Many pieces of equipment possibly discharging contaminants into air not covered by existing Certificate of Approval;
- Sewage works altered without approval;
- Monitoring wells not properly maintained;
- Irregular manifesting procedures, including multiple waste shipments being conducted on single manifests and receipt of shipments of unapproved wastes;
- No waste and packaging audits and insufficient source separation of wastes.

Action: Provincial Officer Order served on August 31, 2004; requirements on company included:

- Apply for new Certificate of Approval for unapproved equipment;
- Apply for new Certificate of Approval for sewage works;
- Comply with required manifesting procedures;
- Obtain the services of a qualified person to maintain monitoring wells;
- Conduct waste audits and prepare waste reduction plans.

Company appealed order to Environmental Review Tribunal and an agreement was reached with the Ministry of the Environment.

Compliance Status: In progress.


Lanxess Inc. - Butyl I Plant
Ministry of the Environment
Legend
Site located within ellipse
Ontario

LANXESS Inc.
(Formerly Bayer Inc., Butyl II Plant)

Site Location: 1265 Vidal Street South, Sarnia

Inspection Report: 1-A9JL

Type of Facility: Chemical plant

Operations: Rubber manufacturing

Associations: Member of Sarnia Lambton Environmental Association (SLEA)

Inspection Date: May 31 – July 8, 2004

Sound Business Practices:

- All discharge devices are labeled, indicating environmentally critical equipment;
- On-site team of five environmental and safety officers.

Issues of Concern:

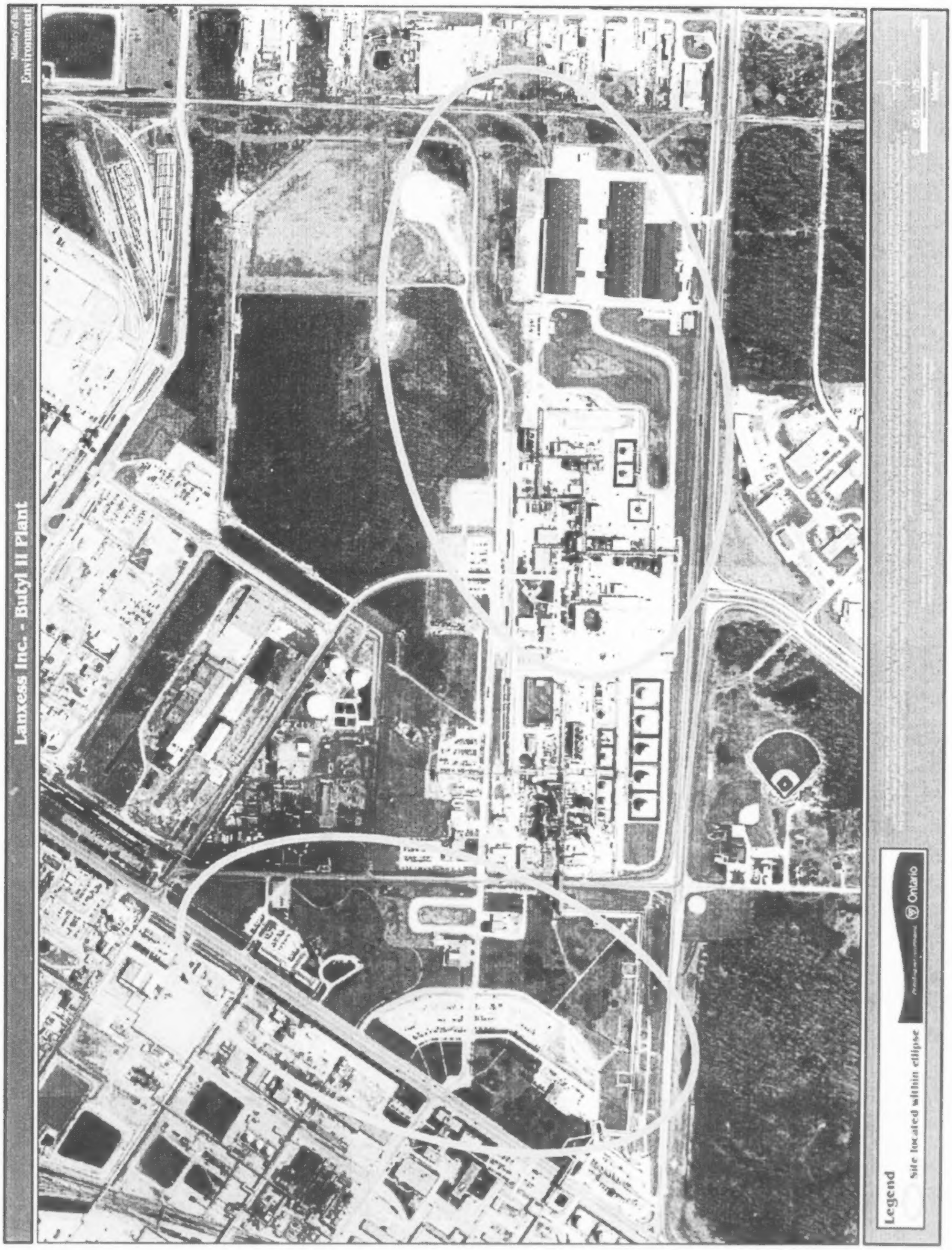
- Many pieces of equipment possibly discharging contaminants into air not covered by existing Certificate of Approval;
- Unapproved storm water collection and management system for warehouse;
- Monitoring wells not properly maintained;
- Irregular manifesting procedures, including multiple waste shipments being conducted on single manifests and receipt of shipments of unapproved wastes;
- No waste and packaging audits and insufficient source separation of wastes.

Action: Provincial Officer Order served on August 31, 2004; requirements on company included:

- Apply for new Certificate of Approval for unapproved equipment;
- Comply with required manifesting procedures;
- Obtain the services of a qualified person to maintain monitoring wells;
- Conduct waste audits and prepare waste reduction plans.

Company appealed order to Environmental Review Tribunal and an agreement was reached with the Ministry of the Environment.

Compliance Status: In progress.


Lanxess Inc. - Butyl II Plant
Ministry of the Environment
Legend
Site located within ellipse
Ontario

LANXESS Inc.
(Formerly Bayer Inc.)

Site Location: Scott Road, Sarnia

Inspection Report: 1-A9JL

Type of Facility: Landfill site

Operations: Landfilling

Associations: Member of Sarnia Lambton Environmental Association (SLEA)

Inspection Date: May 31 – July 8, 2004

Sound Business Practices: None identified.

Issues of Concern:

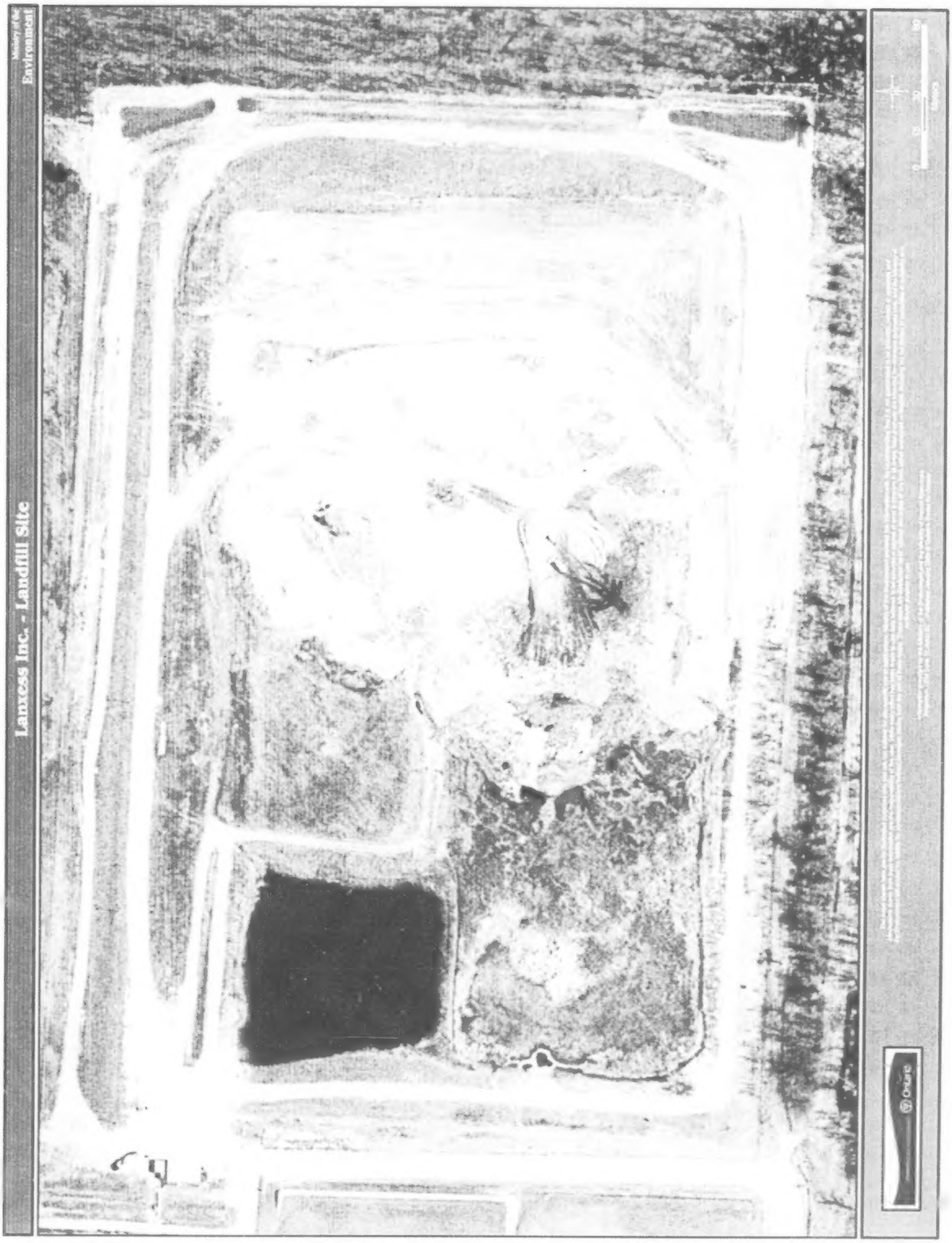
- Some ground water monitoring wells in need of repair;
- One well not decommissioned, as required.

Action: Provincial Officer Order served on August 31, 2004; requirements on company included:

- Obtain the services of a qualified person to maintain monitoring wells;
- Submit Detailed Financial Assurance documentation.

Company appealed order to Environmental Review Tribunal and an agreement was reached with the Ministry of the Environment.

Compliance Status: Complete.


Ministry of the Environment
Lanxess Inc. - Landfill Site
0
15
30
60
Metres

NOVA CHEMICALS (CANADA) LTD.
(Corunna Operations)

Site Location: 785 Petrolia Line, Corunna

Inspection Reports: 1-9U7N

Type of Facility: Chemical plant

Operations: Makes ethylene, propylene and aromatics.

Associations: Member of Sarnia Lambton Environmental Association (SLEA), Canadian Chemical Producers' Association (CCPA), Canadian Petroleum Products Institute (CPPI)

Inspection Date: September 7- 23, 2004

Sound Business Practices:

- Dedicated environmental ("responsible care") staff;
- Consolidated Certificate of Approvals for sewage (January 2005); working on same for air.

Issues of Concern:

- Equipment discharging to air modified without approval, fugitive emission sources not covered by Certificate of Approval;
- Numerous clerical and administrative errors in shipping of wastes;
- Water being taken for without being metered.

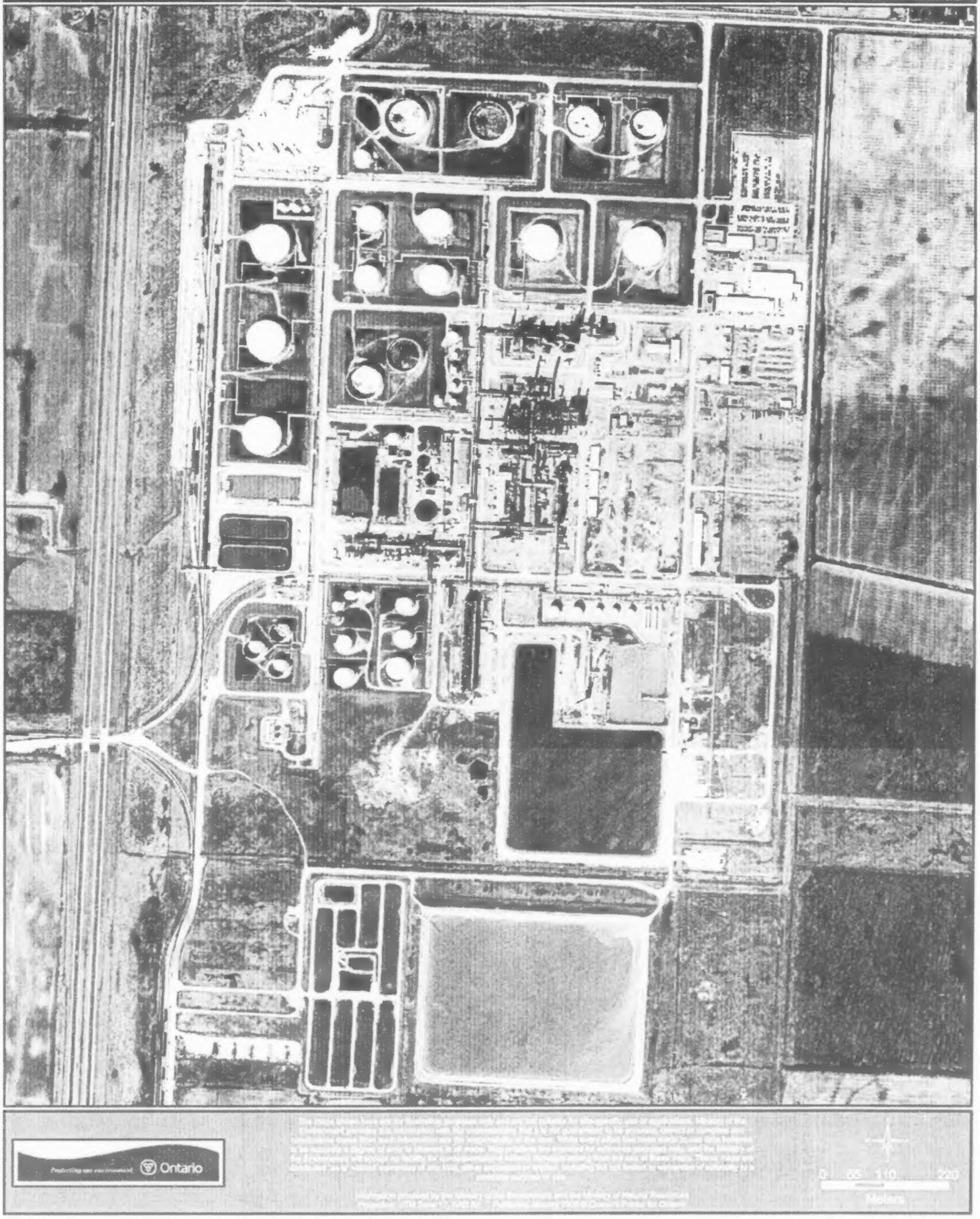
Action: Provincial Officer Order served on January 20, 2005; requirements on company included:

- Apply for Certificate of Approval to include fugitive emission sources;
- Update information for Hazardous Waste Identification Network (HWIN);
- Calculate volume of water taken to recharge storm water holding pond.

Compliance Status: In progress, with compliance dates to May 31, 2005

NOVA Chemicals (Canada) Ltd. - Corunna Operations

Ministry of the Environment



NOVA CHEMICALS (CANADA) LTD.
(Moore Plant)

Site Location: 510 Moore Line, Mooretown

Inspection Reports: 1-9U9H

Type of Facility: Chemical plant

Operations: Makes low-density and high-density resins.

Associations: Member of Sarnia Lambton Environmental Association (SLEA), Canadian Chemical Producers' Association (CCPA); ISO 9001 certified

Inspection Date: July 12 -16, 2004

Sound Business Practices:

- Dedicated environmental ("responsible care") staff.

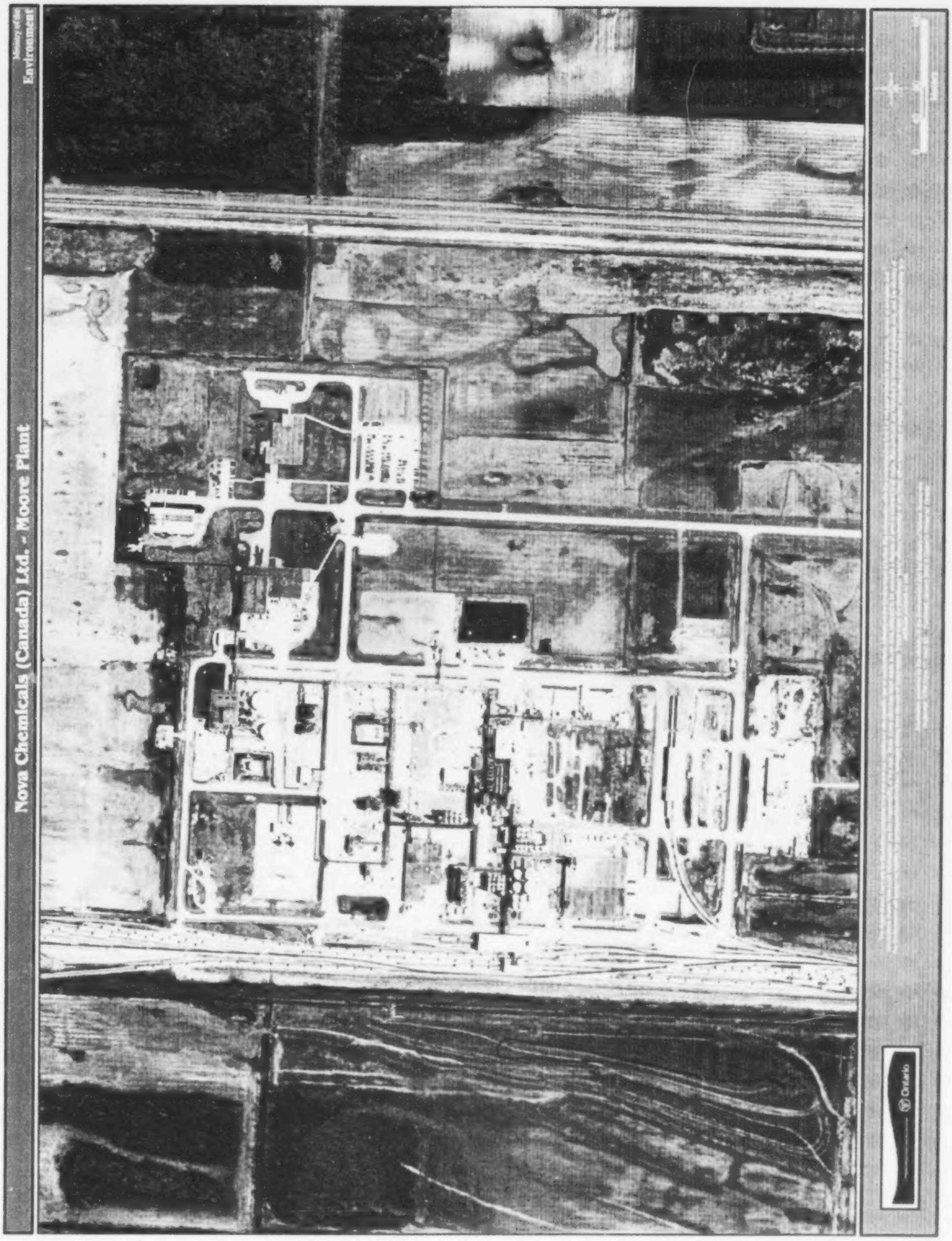
Issues of Concern:

- Twelve sources of emissions to air operating without Certificates of Approval;
- Material being discharged through floor drains in fabrication shop to storm sewer;
- Incorrect manifesting procedures and reporting practices;
- Inadequate spill containment for lube oil drums;

Action: Provincial Officer Order served on January 20, 2005; requirements on company included:

- Apply for Certificates of Approval for 12 sources of emissions to air;
- Prevent material from fabrication shop being discharged to storm sewer;
- Characterize wastes properly according to Generator Registration Guideline Manual;
- Store waste drums in appropriate manner.

Compliance Status: In progress, with compliance dates to May 6, 2005.



Nova Chemicals (Canada) Ltd. - Moore Plant

NOVA CHEMICALS CORPORATION
(St. Clair River Site)

Site Location: 285 Albert Street, Corunna

Inspection Reports: 1-9U8W

Type of Facility: Chemical plant

Operations: Makes low-density and high-density resins.

Associations: Member of Sarnia Lambton Environmental Association (SLEA), Canadian Chemical Producers' Association (CCPA); ISO 9001 certified

Inspection Date: July 26 – September 9, 2004

Sound Business Practices:

- Dedicated environmental ("responsible care") staff.

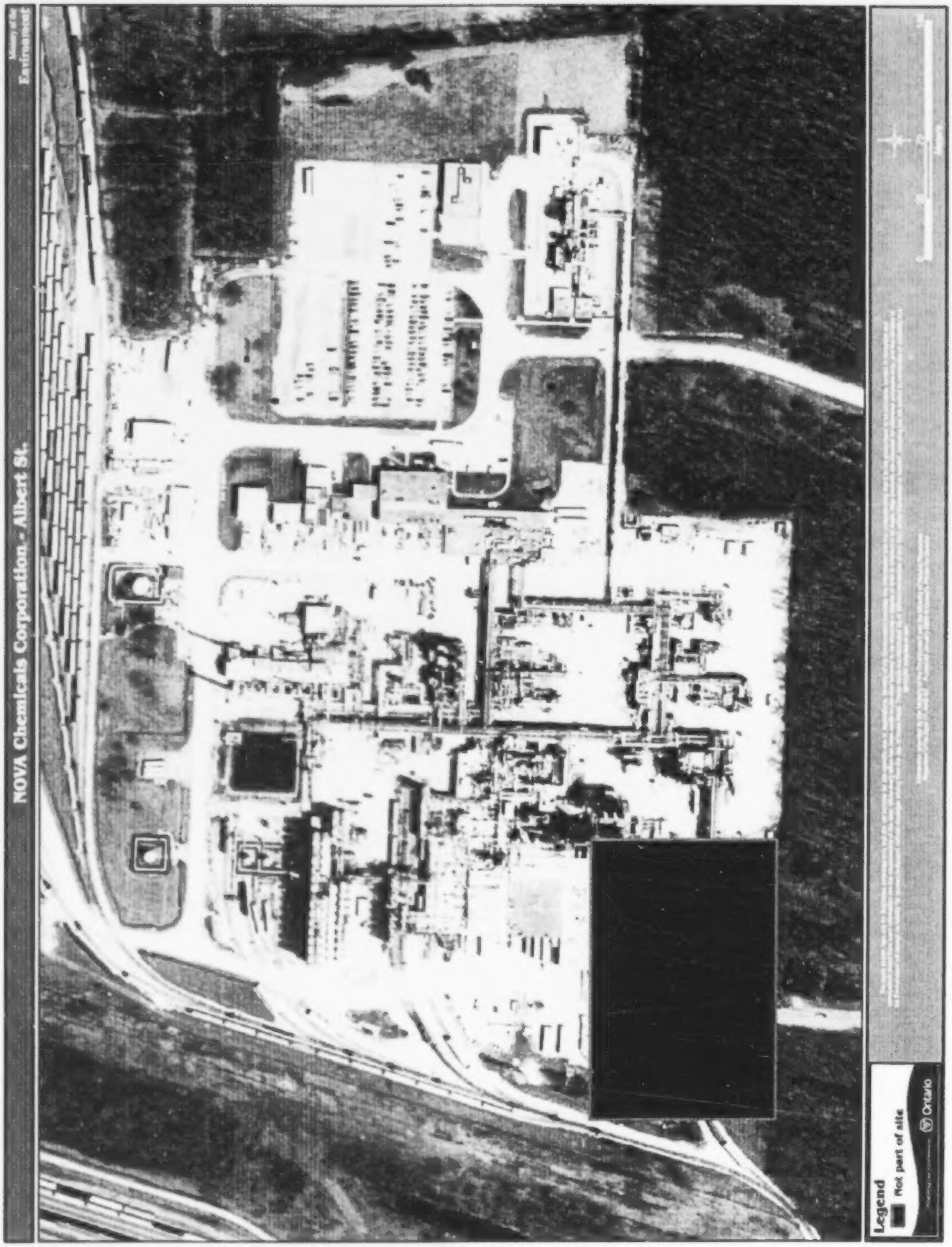
Issues of Concern:

- No Certificates of Approval for certain welding exhausts and cyclone vents;
- Failure to comply with terms and conditions of several Certificates of Approval regarding sewage discharges (e.g., discharges from Invista not covered) ;
- Failure to register and properly classify certain wastes generated on site;
- Failure to amend some Certificates of Approval, as required;
- Inadequate secondary containment to prevent spills;

Action: Provincial Officer Order served on January 20, 2005; requirements on company included:

- Apply for Certificate of Approval for unapproved exhaust systems;
- Apply to have Certificate of Approval amended to cover several waste handling conditions, including discharges from Invista to sewage system;
- Develop and put system in place to ensure accurate reporting of wastes being transferred to waste transportation system;
- Take immediate measures to prevent spill of chemicals into sewer system and the St. Clair River.
- Apply to have Certificate of Approval (air) amended to reflect current operation.

Compliance Status: In progress.



NOVA Chemicals Corporation - Albert St.
Ministry of the Environment
Legend
Not part of site
Ontario

NOVA CHEMICALS CORPORATION
(Sarnia)

Site Location: 872 Tashmoo Avenue, Sarnia

Inspection Reports: 1-D16L

Type of Facility: Chemical plant

Operations: Makes styrene.

Associations: Member of Sarnia Lambton Environmental Association (SLEA), Canadian Chemical Producers' Association (CCPA), Canadian Petroleum Products Institute (CPPI); ISO 9001 certified

Inspection Date: February 24 – March 5, 2004

Sound Business Practices:

- Entire site bermed;
- All storm water collected and piped to Lanxess Inc. Blox plant for treatment.

Issues of Concern:

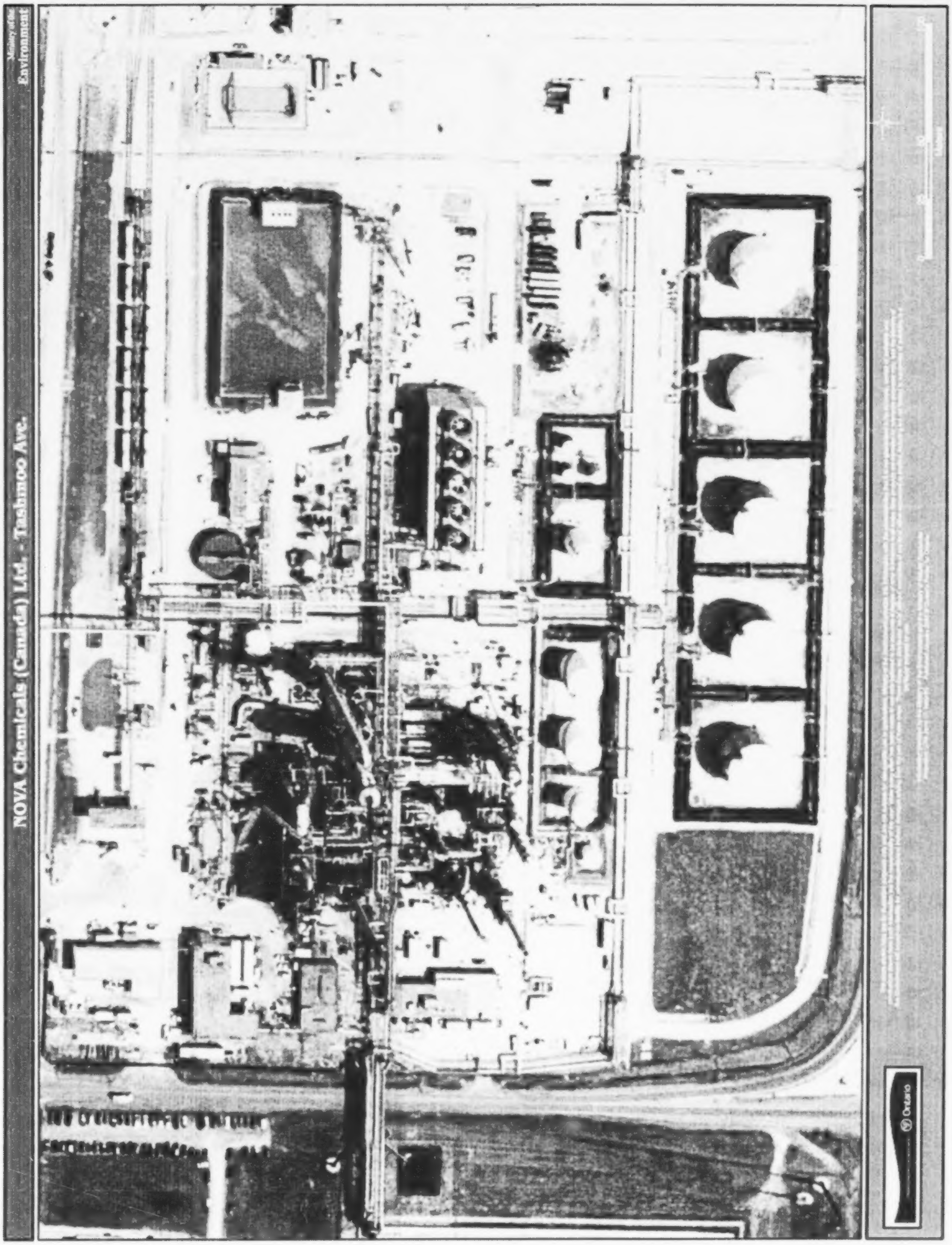
- No Certificates of Approval for numerous sources of emissions to air;
- Amendments to Certificates of Approval required for client name and address changes;
- Amendments to Certificates of Approval required for additions and removal of equipment;
- Solid excavation wastes and unknown liquid wastes being stored without proper characterization;
- Groundwater monitoring wells with damaged casings;
- High levels of benzene found in monitoring well;
- Failure to produce spill prevention plan regarding site mechanical integrity.

Action: Company applied, without Order, for new Certificates of Approval and amendments to existing Certificates of Approval for both air emissions and liquid wastes. Provincial Officer Order served on April 8, 2004; requirements on company included:

- Apply to have Certificates of Approval (Air) amended;
- Apply for new Certificates of Approval (Air);
- Apply to have Certificate of Approval (Sewage) amended;
- Retain a qualified contractor to maintain the wells, assess the ground water contamination and report to the Ministry;
- Comply with storage and management of subject waste;
- Retain a qualified person to prepare a Spills Plan and report to the Ministry.

Company requested review of Order on April 15, 2004. Director's Order served on April 27, then revoked and new Order issued on July 21, 2004.

Compliance Status: In progress.



NOVA Chemicals (Canada) Ltd. - Tashmoo Ave.

NOVA CHEMICALS CORPORATION
(Sarnia)

Site Location: 1367 Vidal Street South, Sarnia

Inspection Reports: 1-A0HZ

Type of Facility: Former chemical plant

Operations: Currently used for storage of both finished product, and off spec product. The facility also stores contaminated storm water from the production plant at 872 Tashmoo Avenue. The contaminated storm water is treated, and piped off site to the Bayer Biox Plant for tertiary treatment prior to discharge to the St. Clair River.

Associations: Member of Sarnia Lambton Environmental Association (SLEA), Canadian Chemical Producers' Association (CCPA), Canadian Petroleum Products Institute (CPPI); ISO 9001 certified

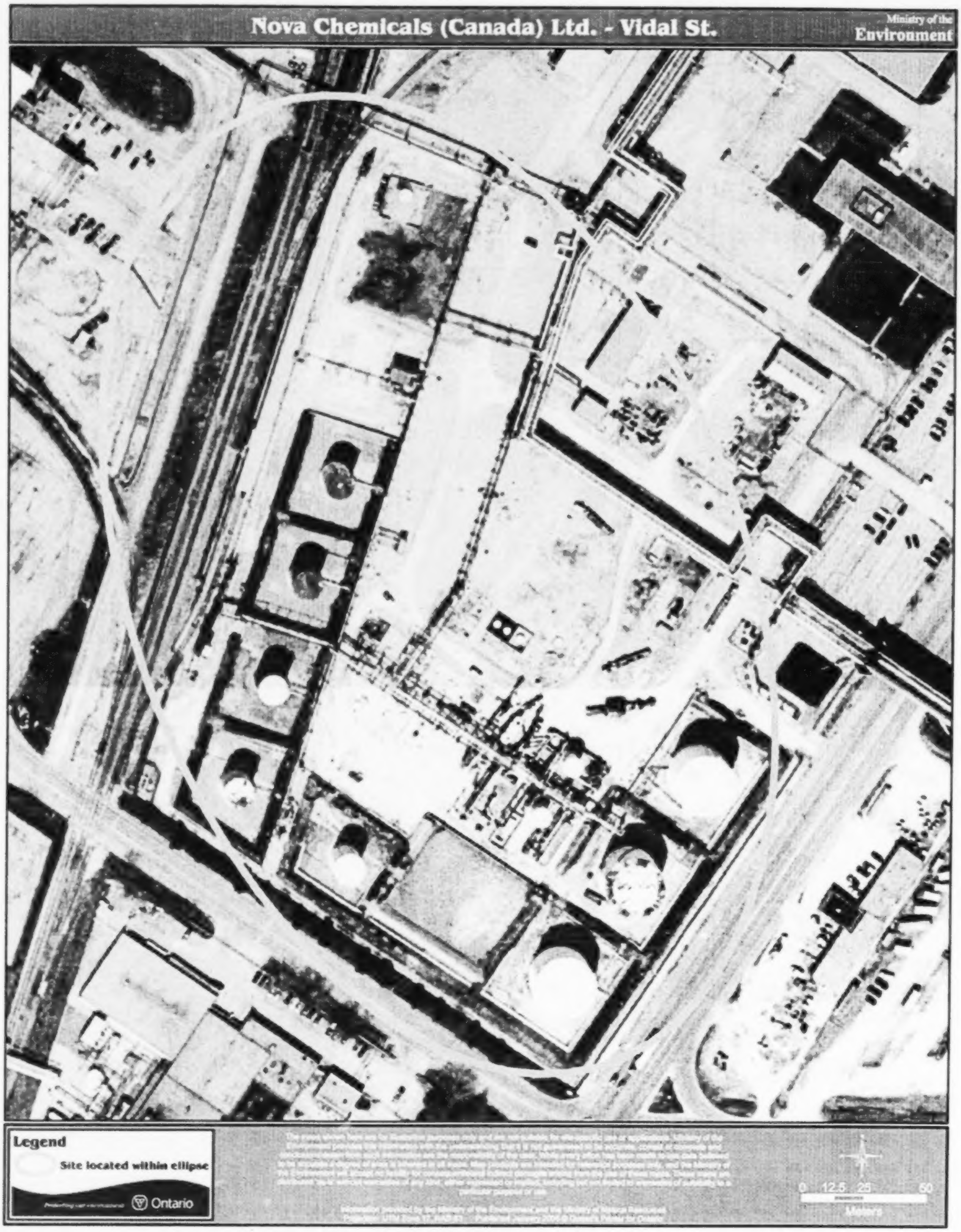
Inspection Date: February 24 – March 4, 2004

Sound Business Practices: None identified.

Issues of Concern: None identified.

Action: None.

Compliance Status: N/A


Nova Chemicals (Canada) Ltd. - Vidal St.
Ministry of the Environment
Legend
Site located within ellipse
Ontario
0 12.5 25 50
Meters

ONTARIO POWER GENERATION, LAMBTON

Site Location: Highway 33, Courtright

Inspection Report: 1-9UKT

Type of Facility: Thermal Generating Station

Operations: Electric power generation

Associations: Member of Sarnia Lambton Environmental Association (SLEA); ISO 14001 certified

Inspection Date: August 23 – September 3, 2004

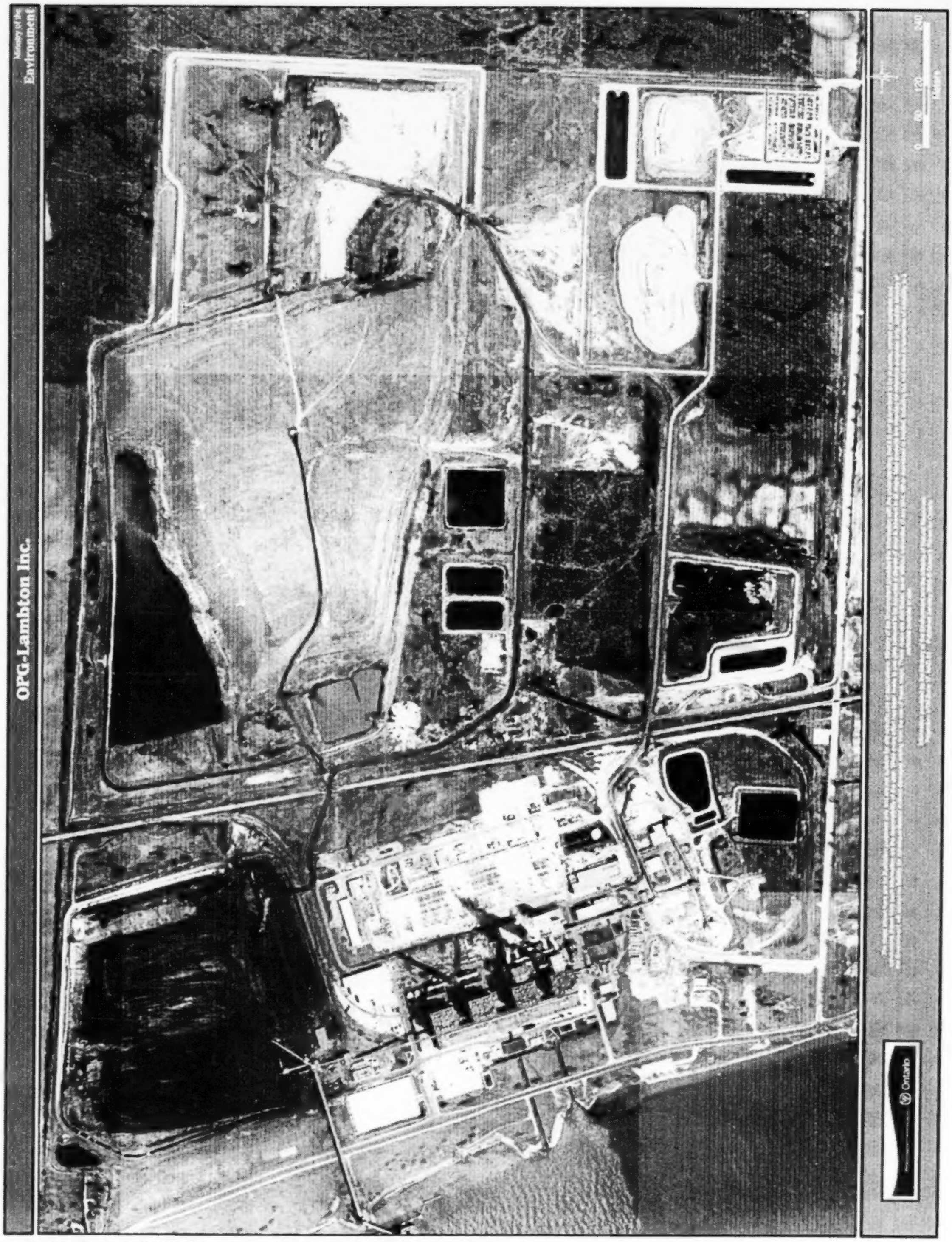
Sound Business Practices:
- Redundant systems on sensors, with staff follow-up;
- Storm water management utilizing minimum treatment;
- Recycling and reuse where possible;
- Waste stream from scrubber produces gypsum, which is then sold as drywall-like product;
- Specific work orders to operations generated by automated proactive maintenance schedule.

Issues of Concern:
- No monitoring, as required under Certificate of Approval, of the temperature of the outfall from the north yard drain to the St. Clair River;
- Pooled water on groundwater well heads.

Action: Provincial Officer Order served on January 20, 2005; requirements on company included:
- Ensure better maintenance of groundwater wells;
- Complete inspections of wells as required by Ontario Regulation 903;
- Come into compliance with the Certificate of Approval for sewage;
- Monitor the temperature on a parking lot drain;
- Take preventative measures during unloading of coal.

Director's Order issued January 20, 2005.

Compliance Status: In Progress, to be completed by April 24, 2005 (90 days after serving of orders).



OPG-Lambton Inc.
Ministry of the Environment
0 60 120 240
Ontario

PRAXAIR CANADA INC.

Site Location: 1832 Vidal Street South, Sarnia

Inspection Report: 1-CF6M

Type of Facility: Gas Plant

Operations: Makes various industrial and commercial gasses.

Associations: None identified.

Inspection Date: June 7- 30, 2004

Sound Business Practices:

- In-house technical evaluation of equipment on a regular basis;
- Contingency planning (what-if scenarios);
- Hazardous operability (HAZOP) studies.

Issues of Concern:

- Nine pieces of equipment with emissions to air not covered by Certificate of Approval;
- Chemicals in use not covered by Certificate of Approval.

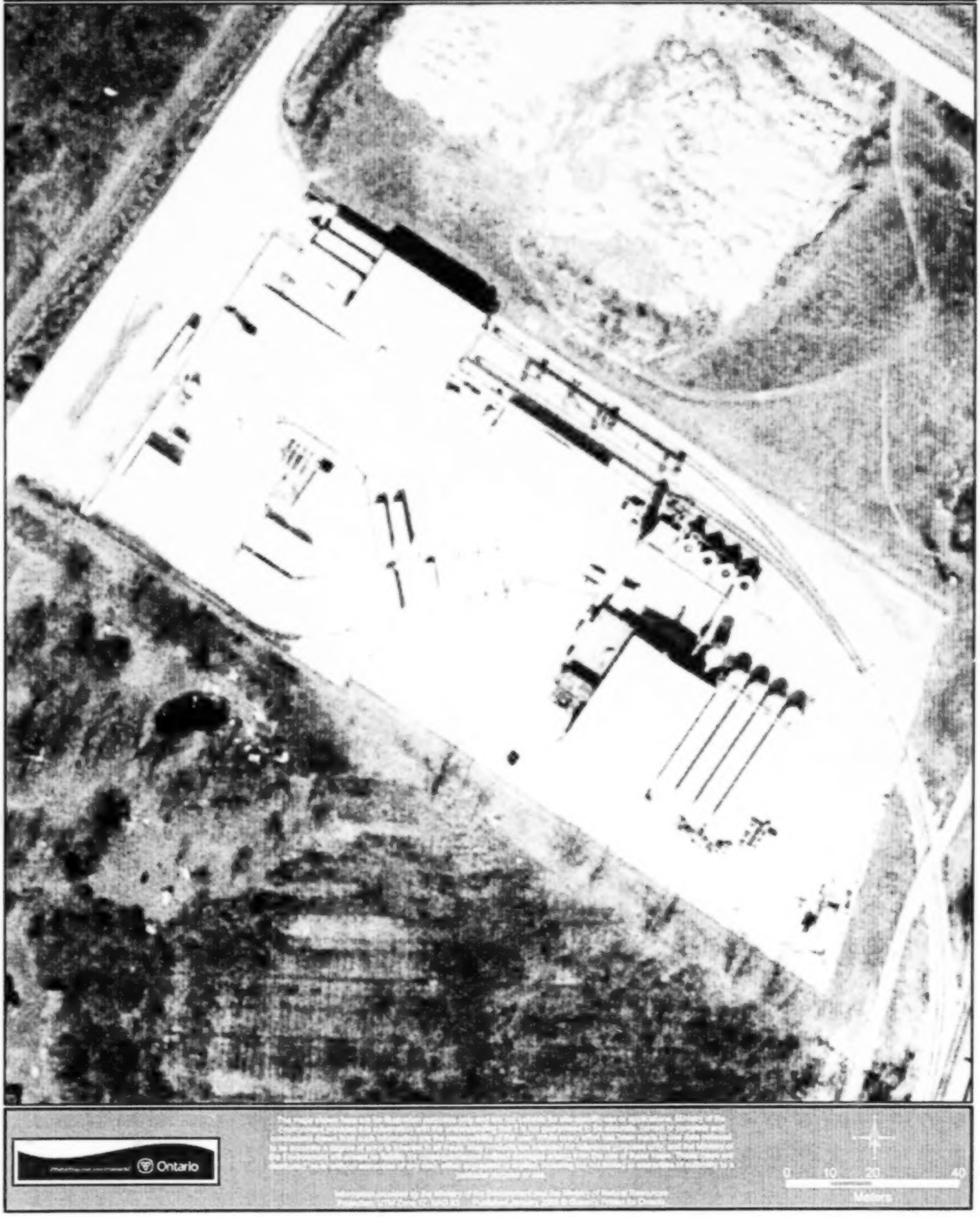
Action: Provincial Officer Order served on August 31, 2004; requirements on company included:

- Apply to have Certificate of Approval amended to include unapproved equipment;
- Apply to have Certificate of Approval amended to include chemicals.

Compliance Status: Complete.

Praxair Canada Inc. - 1832 Vidal St.

Ministry of the
Environment



PRAXAIR CANADA INC.

Site Location: 915 Vidal Street South, Sarnia

Inspection Report: 1-AA11

Type of Facility: Gas Plant

Operations: Makes various industrial and commercial gases.

Associations: None identified.

Inspection Date: June 8 -30, 2004

Sound Business Practices: None identified.

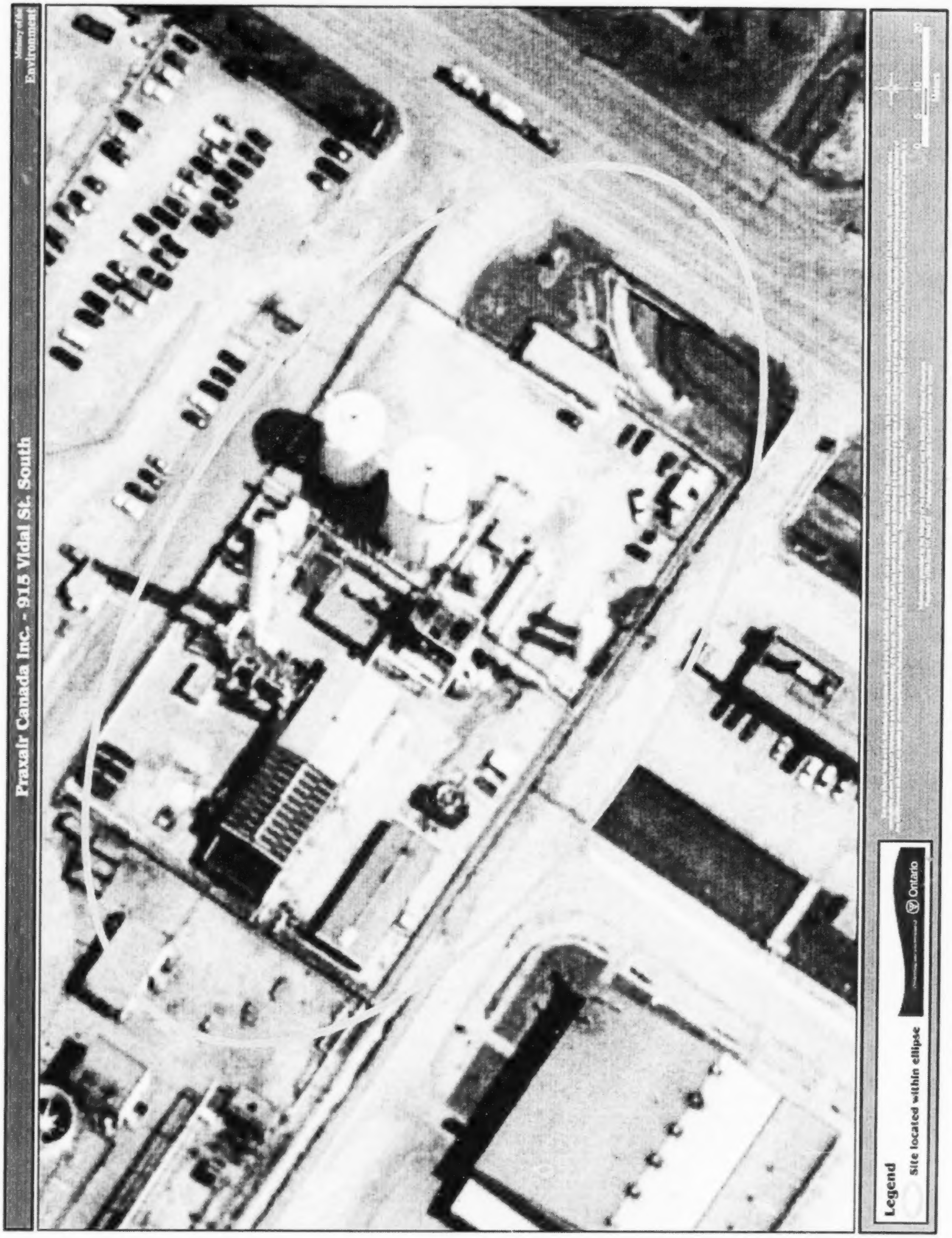
Issues of Concern:

- Four pieces of equipment with emissions to air not covered by Certificate of Approval;
- Inadequate containment for above-ground storage tanks, no spill contingency plan.

Action: Provincial Officer Order served on August 31, 2004; requirements on company included:

- Apply to amend Certificate of Approval to include unapproved equipment;
- Prepare spill contingency plan.

Compliance Status: Complete.


Praxair Canada Inc. - 915 Vidal St. South
Ministry of the Environment
Legend
Site located within ellipse
Ontario
0
5
10
20
Meters

ROYAL POLYMERS LIMITED

Site Location: 900 Vidal Street South, Sarnia

Inspection Report: 1-9U74

Type of Facility: Chemical plant

Operations: Makes polymer-based home improvement, consumer and construction products.

Associations: Member of Sarnia Lambton Environmental Association (SLEA)

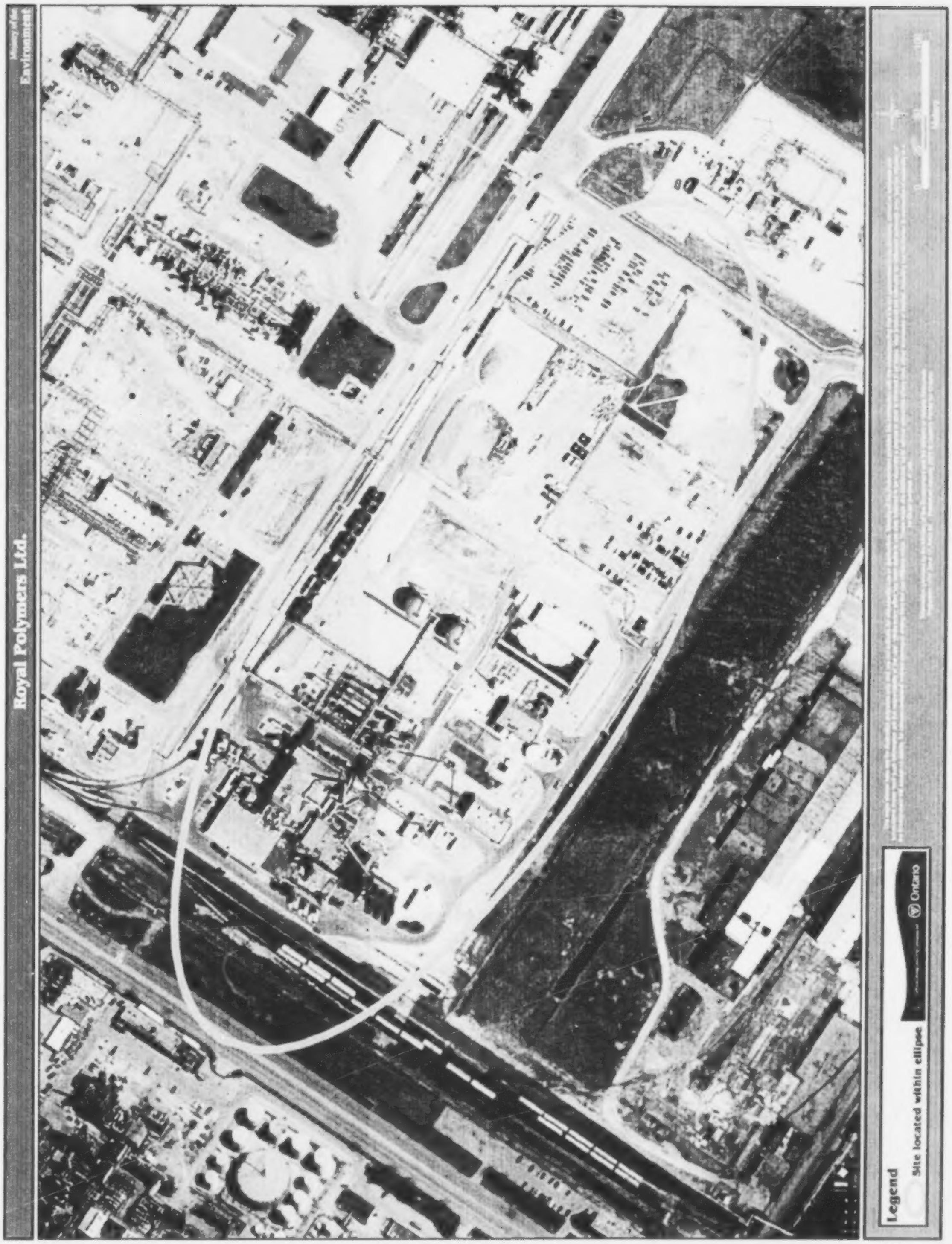
Inspection Date: September 21 – October 1, 2004

Sound Business Practices: None identified.

Issues of Concern:
- Inadequate containment in chemical storage area;
- Manifest record-keeping copies missing.
- Unapproved equipment not covered by current Certificate of Approvals for air.
- Not complying with current Certificate of Approval for taking samples.

Action: Provincial Officer Order served April 12, 2005; requirements on company included:
- Apply to have its Certificate of Approval amended to include all equipment;
- Start complying with its Certificate of Approval by sampling and monitoring pH.

Compliance Status: To be determined. Order issued April 12, 2005.


Ministry of the Environment
Royal Polymers Ltd.
Legend
Site located within ellipse
Ontario

SCU NITROGEN CANADA

Site Location: 161 Bickford Line, Courtright

Inspection Report: 1-9MME

Type of Facility: Fertilizer plant

Operations: Makes sulphur-coated urea.

Associations: None identified.

Inspection Date: February 24 -25, 2004.

Sound Business Practices:

- Secondary containment around all but one process unit;
- Conductivity monitors on condensate and storm water;
- Additional conductivity meters on surface run-off leaving property.

Issues of Concern:

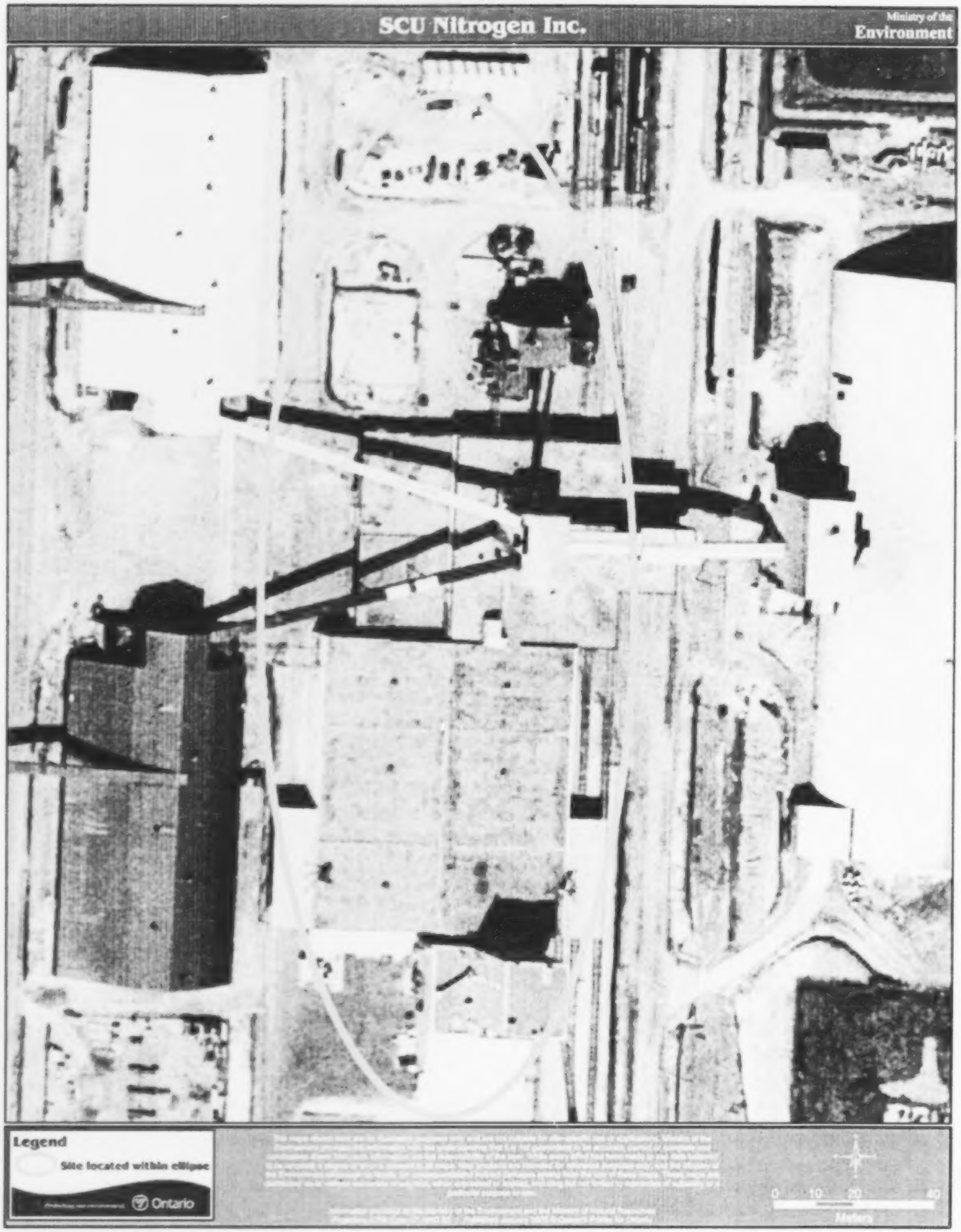
- Two pieces of equipment with emissions to air not covered by Certificate of Approval:
- No spill contingency plan.

Action: Provincial Officer Order served on April 8, 2004; requirements on company included:

- Apply to have Certificate of Approval amended to include unapproved equipment;
- Prepare spill contingency plan.

Compliance Status: Complete.

SCU Nitrogen Inc.



SHELL CANADA PRODUCTS LTD.

Site Location: 150 St. Clair Parkway, Moore

Inspection Report: 1-9MLA

Type of Facility: Petroleum refinery

Operations: Produces liquefied petroleum gas, gasoline, jet fuel, solvents and bunker fuel. Also operates docking facilities for vessels on the St. Clair River.

Associations: Member of Sarnia Lambton Environmental Association (SLEA), Canadian Chemical Producers' Association (CCPA), Canadian Petroleum Products Institute (CPPI), American Petroleum Institute (API), Chemical Valley Emergency Coordinating Organization (CVECO)

Inspection Date: March 29 – April 23, 2004.

Sound Business Practices:

- Computerized, preventative maintenance schedule;
- Automated wastewater treatment plant with effluent monitoring, connected to alarms capable of diverting effluent to storage pond.

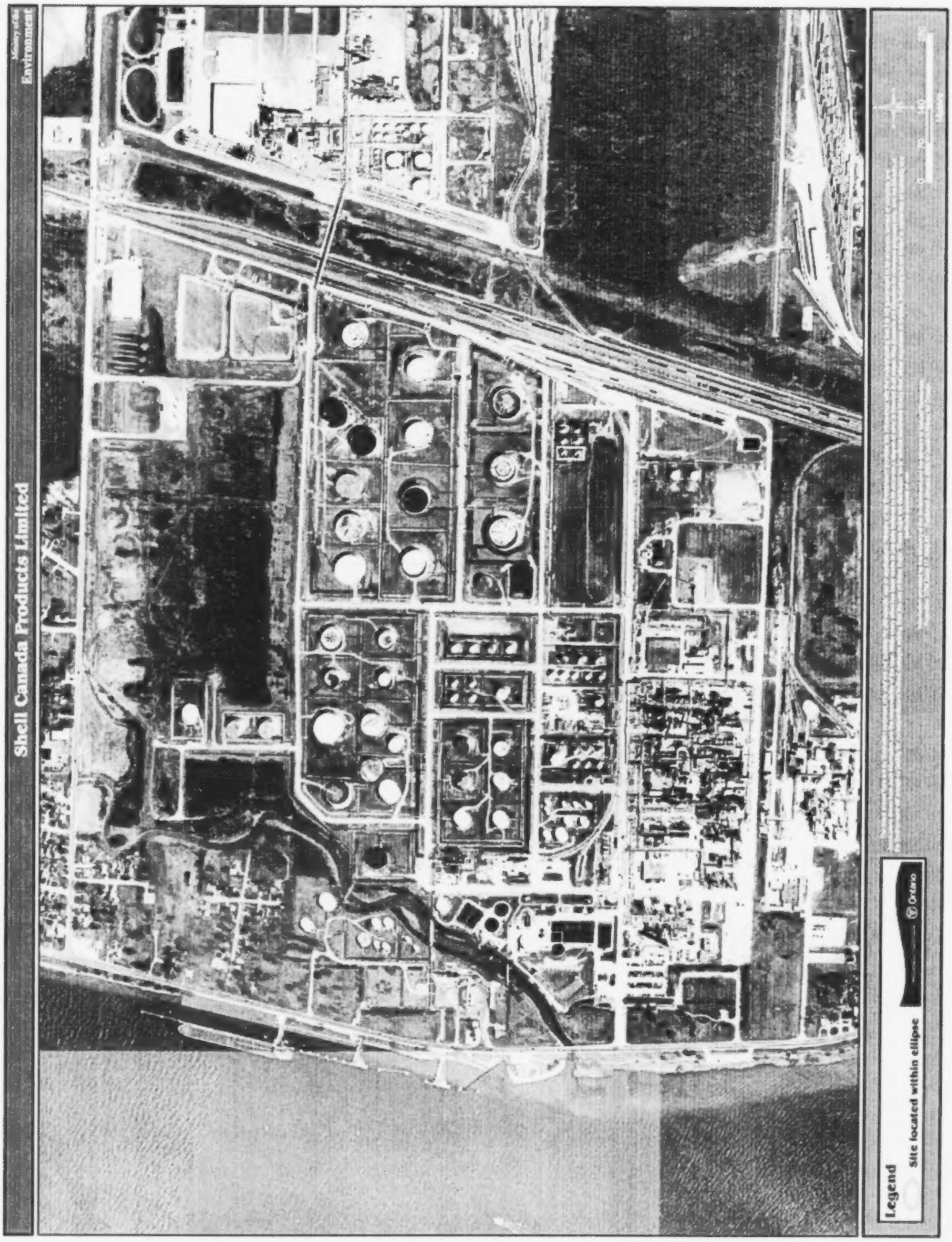
Issues of Concern:

- Several pieces of equipment with emissions to air not covered by Certificate of Approval;
- Wastewater accepted for treatment from Basell without a Certificate of Approval;
- Improper storage of waste in drums.

Action: Provincial Officer Order served on August 31, 2004; requirements on company included:

- Apply for Certificate of Approval for equipment not covered;
- Apply to have Certificates of Approval amended to reflect changes to flare system and changes in composition to flue gas fuel oil;
- Apply for Certificate of Approval to accept wastewater for treatment in wastewater plant;
- Provide appropriate secondary containment for storage of waste in drums.

Compliance Status: In progress, with compliance dates to July 5, 2005.


Shell Canada Products Limited
Ministry of the Environment
Legend
Site located within ellipse
Ontario

SUNCOR ENERGY PRODUCTS INC.

Site Location: 187 Clarence Street, Sarnia

Inspection Report: 1-9U6N

Type of Facility: Petroleum refinery/chemical plant

Operations: Produces gasoline, kerosene, home heating oil, jet and diesel fuels, residual oils for industrial fuels. Also makes aromatics (benzene, toluene, xylene) as feedstocks in the production of plastics and pharmaceuticals.

Associations: Member of Sarnia Lambton Environmental Association (SLEA), Canadian Petroleum Products Institute (CPPI); ISO 14001 certified

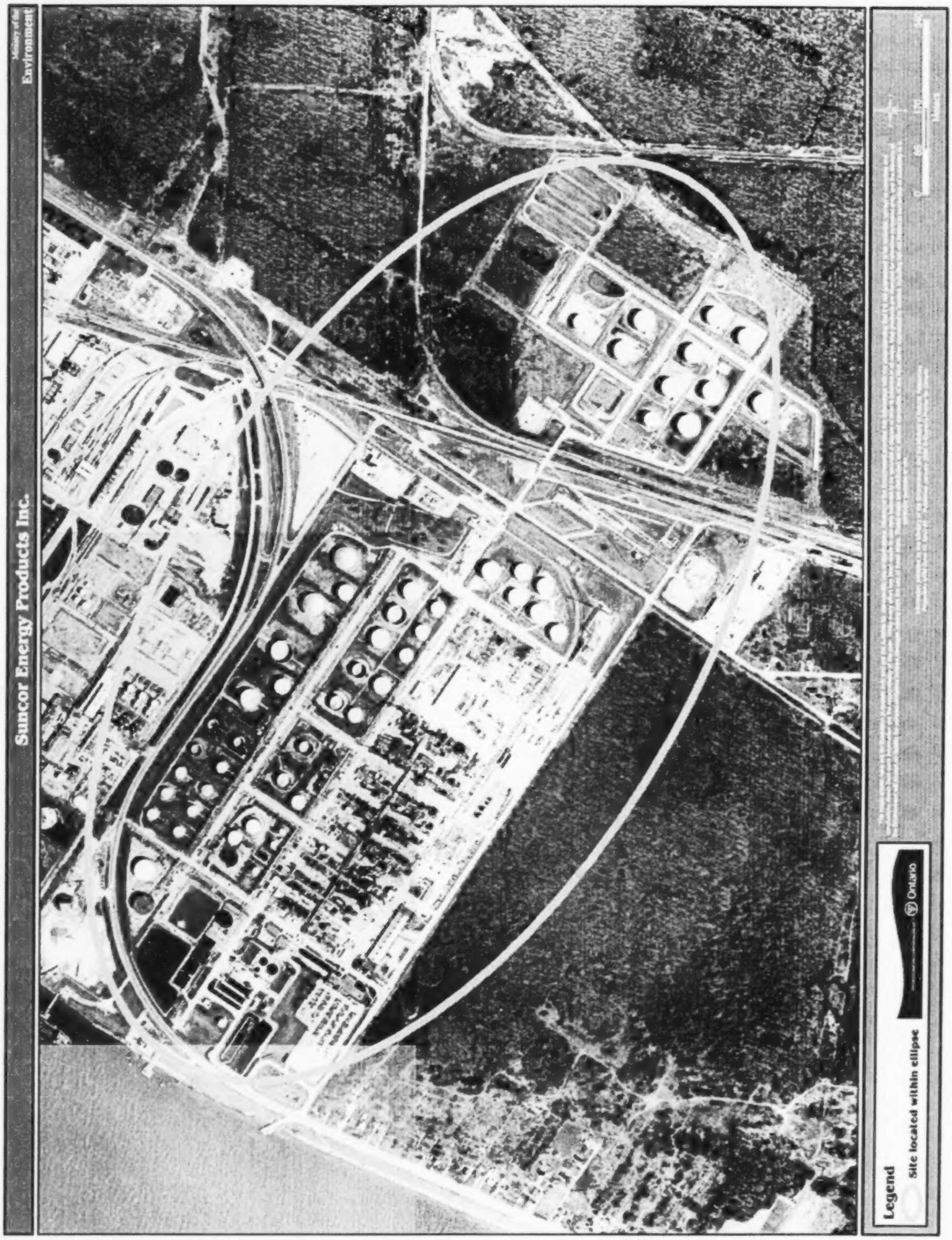
Inspection Date: June 21 – July 9, 2004

Sound Business Practices: None identified.

Issues of Concern:
- No Certificate of Approval for emissions to air from 41 above-ground storage tanks;
- Source separation and waste reduction plans not implemented, waste audits not conducted;
- Groundwater monitoring wells poorly maintained.

Action: Provincial Officer Order served on August 31, 2004; requirements on company included:
- Apply for Certificate of Approval to include above-ground storage tanks;
- Prepare and supply waste reduction and source separation plans;
- Complete survey of groundwater monitoring wells.

Compliance Status: Complete.


Ministry of the Environment
Suncor Energy Products Inc.
Legend
Site located within ellipse
Ontario

TERRA INTERNATIONAL (CANADA) INC.

Site Location: 161 Bickford line, Courtright

Inspection Report: 1-9UJ3

Type of Facility: Chemical Plant (Fertilizer)

Operations: Produces sulphur-coated urea.

Associations: Member of Sarnia Lambton Environmental Association (SLEA)

Inspection Date: April 13 -21, 2004

Sound Business Practices:

- Berms around storage tanks;
- pH and conductivity meter connected to trip gates in discharge ditch;
- Alarmed gate for diverting discharge to containment lagoon when necessary;
- Skimming and absorbent booms located in discharge ditch.

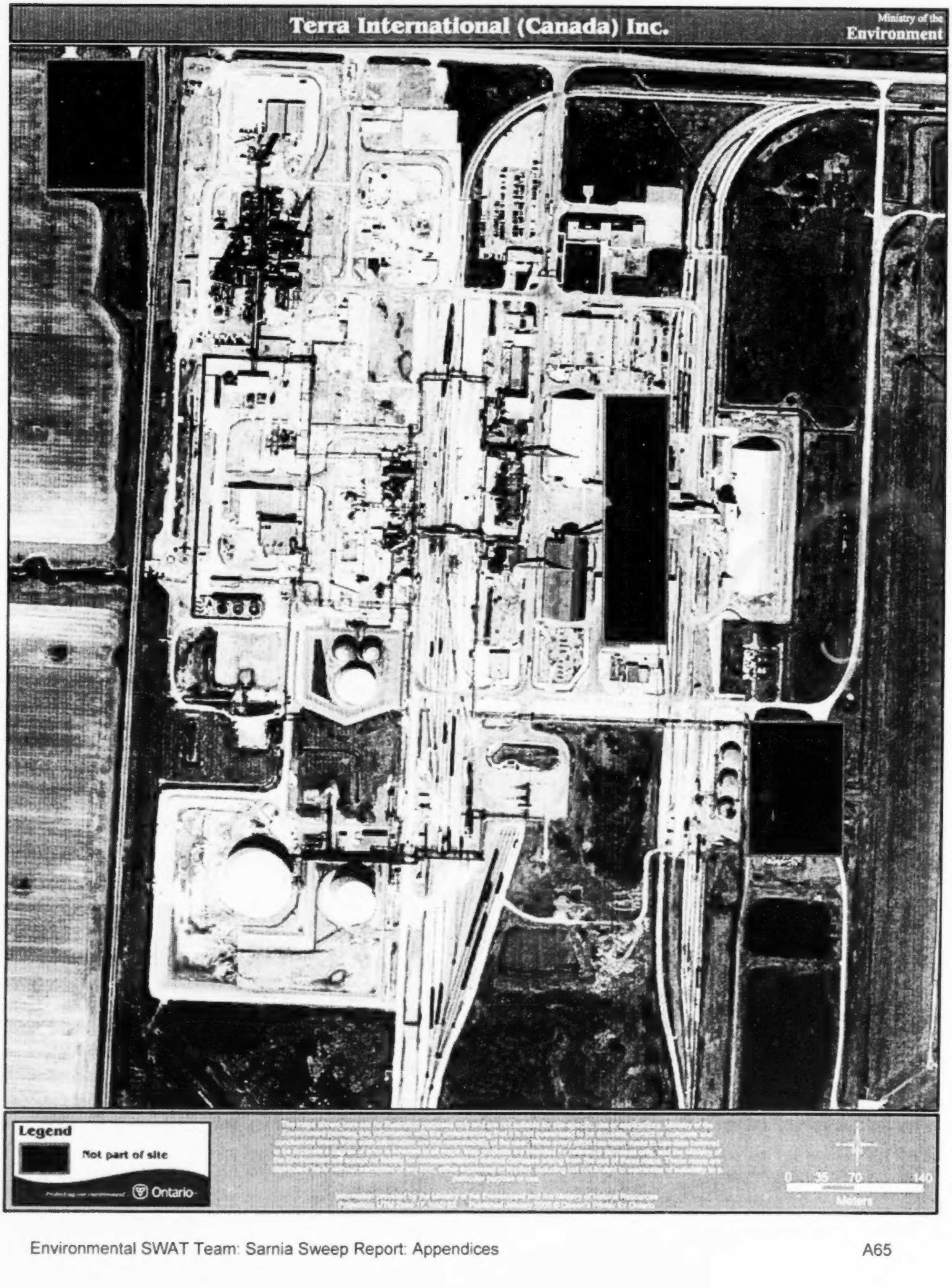
Issues of Concern:

- No Certificate of Approval for emissions to air from seven sources;
- Wastes stored on site longer than 90 days;
- Improper mixing of wastes for transport;
- Manifest copies for shipped wastes not retained for two years;
- Unapproved increase in production capacity, resulting in a potential increase in emissions to air;
- Improper sewage sludge dewatering process;
- Lack of a general spill contingency plan;
- Poorly maintained groundwater monitoring wells;
- Exceeding effluent discharge limitations under Effluent Monitoring and Effluent Limits regulations.

Action: Provincial Officer Order served on July 13, 2004; requirements on company included:

- Apply to have Certificates of Approval (air) amended to include unapproved sources;
- Apply to obtain Certificates of Approval (air) to include unapproved sources;
- Apply to amend Certificate of Approval (sewage);
- Improve subject waste handing practices by submitting a storage report, stop processing sludge and mixing waste;
- Prepare waste reduction work plan;
- Identify the cause of a Effluent Monitoring and Effluent Limits regulations exceedence.

Compliance Status: Complete.


Terra International (Canada) Inc.
Ministry of the Environment
Legend
Not part of site
Ontario
0
35
70
140
Meters

TRANSALTA ENERGY CORPORATION
(Power Island)

Site Location: 1741 River Road, Sarnia

Inspection Report: 1-9UHW

Type of Facility: Co-generation plant (Electric/steam)

Operations: Generation of electric and steam energy for HydroOne grid and neighbouring petrochemical plants.

Associations: Member of Canadian Electrical Association

Inspection Date: September 13 -24, 2004

Sound Business Practices:
- Environmental compliance consultant recently hired;
- Heat reclamation units used with new turbines;
- Old boilers and super-heaters mothballed.

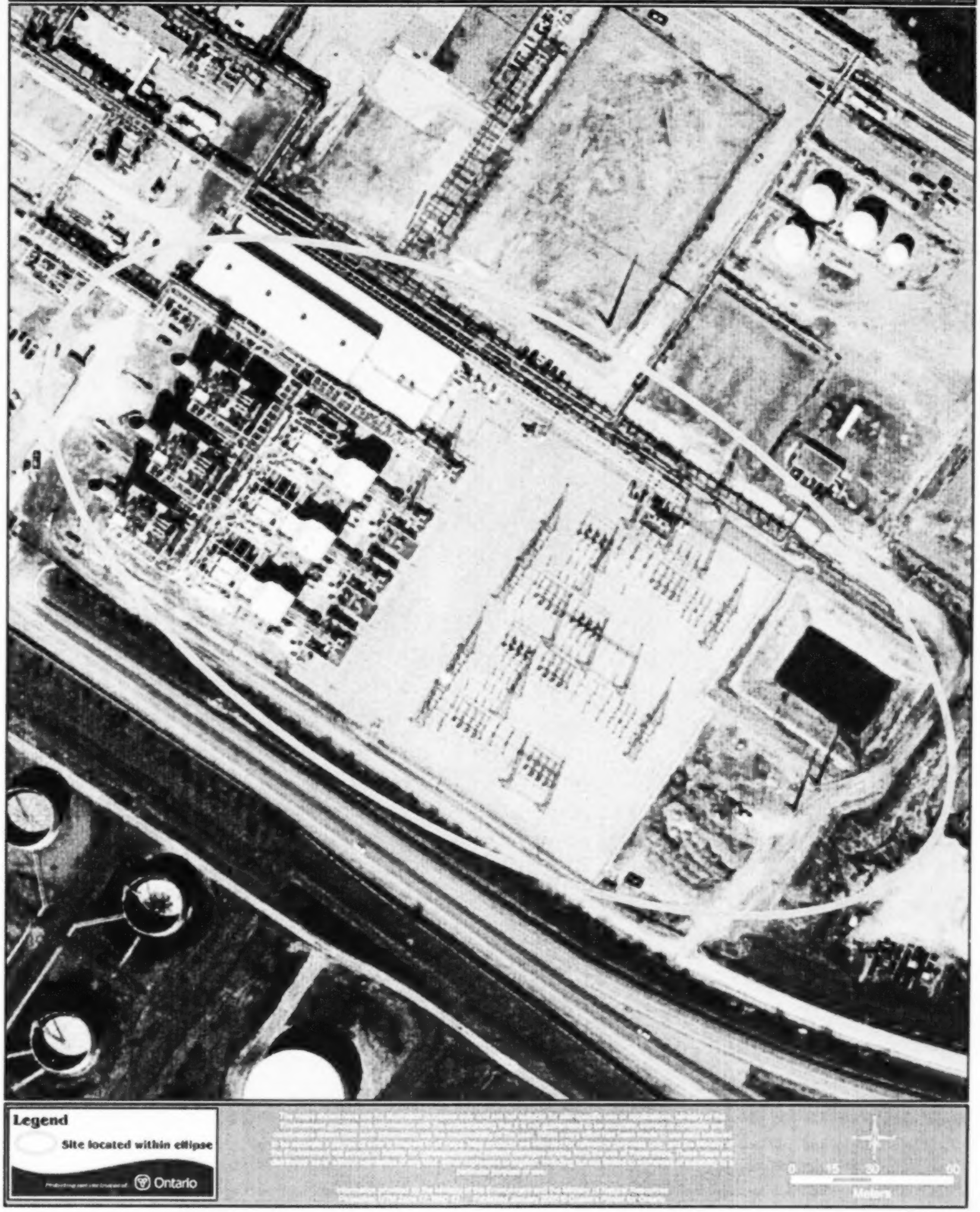
Issues of Concern:
- Sewage effluent often exceeding maximum daily loadings;
- Clerical and administrative errors in shipping wastes;

Action: Provincial Officer Order served on January 20, 2005; requirements on company included:
- Investigate and produce a report outlining compliance with existing terms and conditions for amounts of sewage effluent allowed per day;
- Update HWIN information.

Compliance Status: In progress.

TransAlta Energy Corporation - Power Island

Ministry of the Environment



TRANSALTA ENERGY CORPORATION
(South Block)

Site Location: 1741 River Road, Sarnia

Inspection Report: 1-H5OT

Type of Facility: Co-generation plant (Electric/steam)

Operations: Generation of electric and steam energy for HydroOne grid and neighbouring petrochemical plants.

Associations: Member of Canadian Electrical Association

Inspection Date: September 13 -24, 2004

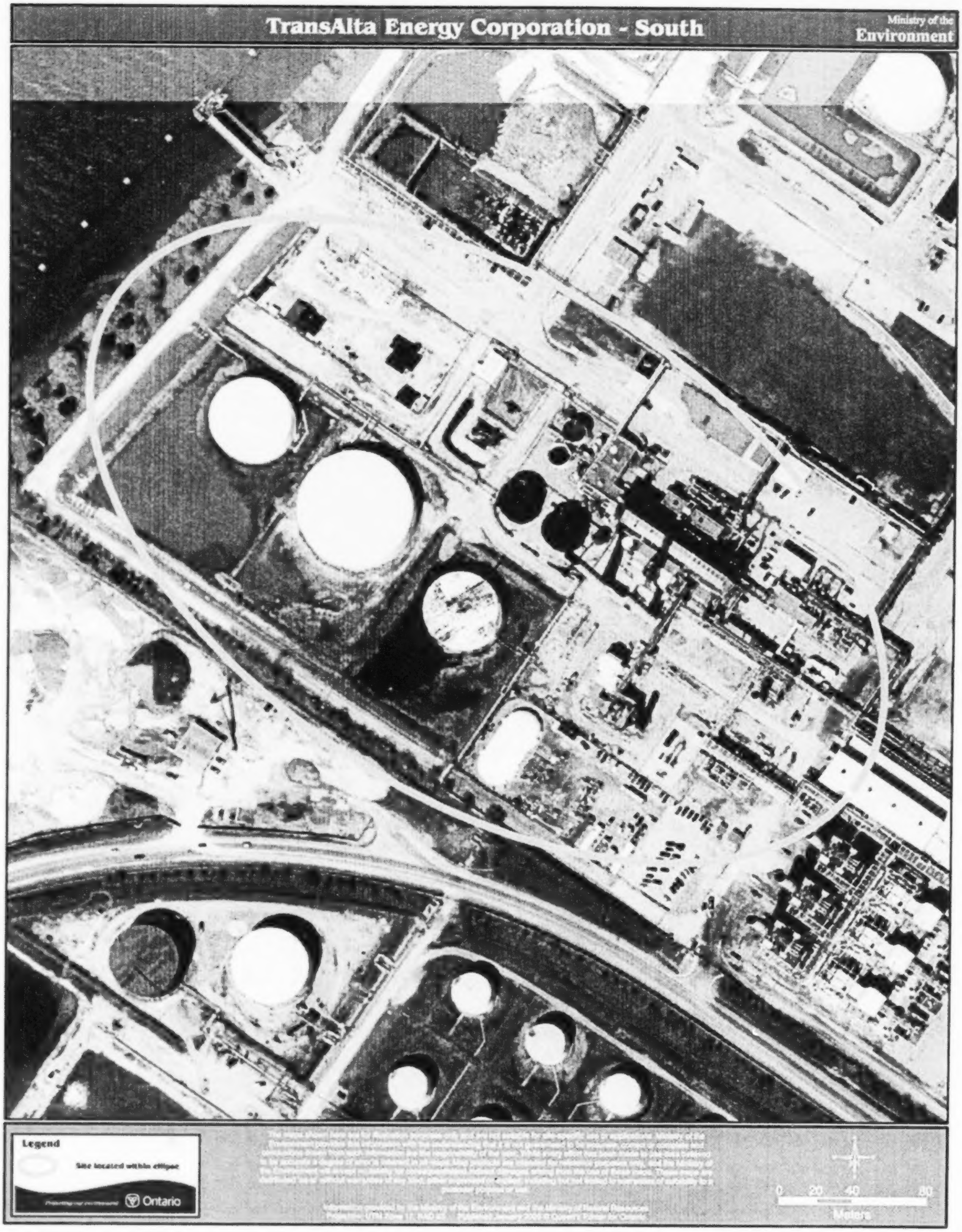
Sound Business Practices: None identified.

Issues of Concern: None identified.

Action: Provincial Officer Order served on January 20, 2005; requirements on company included:

- No actions directed to this specific location.

Compliance Status: In progress.


TransAlta Energy Corporation - South
Ministry of the Environment
Legend
Site located within ellipse
Ontario
0
20
40
80
Meters

TRANSALTA ENERGY CORPORATION
(North Block)

Site Location: 1741 River Road, Sarnia

Inspection Report: 1-H5OE

Type of Facility: Co-generation plant (Electric/steam)

Operations: Generation of electric and steam energy for HydroOne grid and neighbouring petrochemical plants.

Associations: Member of Canadian Electrical Association

Inspection Date: September 13 -24, 2004

Sound Business Practices:

- Recently installed high-technology, steam super-heater (highly efficient, can burn alternative fuels).

Issues of Concern:

- Lack of sampling of alternative fuel supplied by Lanxess;
- Sewage effluent often exceeding maximum daily loadings.

Action: Provincial Officer Order served on January 20, 2005; requirements on company included:

- Complete full analysis of alternative fuel supplied by Lanxess;
- Investigate and produce a report outlining compliance with existing terms and conditions for amounts of sewage effluent allowed per day.

Compliance Status: In progress.

TransAlta Energy Corporation - North

Ministry of the Environment